DECEMBER 14, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

14,500 Metalworkers Will Expand In 1960; Boost Total Capacity 4.5%

Minimize the Cost of a Price Hike

Europe's Two Trading Blocs: How Will They Affect American Industry?

Handle Zinc Coated Sheets With Care

How to Buy Better Welding Quality

The Outlook for Steel Sheets

EXPLOSION in Production

Explosive forming is a rapidly expanding profit producer at Ryan Aeronautical Co., San Diego, Calif. Engineers there report dramatic cost and time advantages on many problem forming jobs. On a jet engine intake cone, for example, the cost to the customer dropped from $131 to $15. For details, see Page 98.

COMPLETE CONTENTS
TURN PAGE

METALWORKING OUTLOOK
PAGE 49

if you surface grind small work

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When you want to get a better finish, easier and at *lower cost*, put your small surface grinding work on a Heald Model 161 Rotary. Available with a standard 6" chuck and 8" auxiliary top plate, it will handle work with a swing of up to 12½" inside the guard. On long runs or short, it will give you the high precision and fine surface finish that you'd expect only from a larger and much more costly machine.

Only the Heald Model 161 Rotary Surface Grinder offers you all these big-machine features in a small-size, low price unit: manual or power reciprocation — dry or wet grinding — simple operation — precision chuck swivel for flat, convex or concave grinding — powerful direct-drive wheelhead — vertical column construction — precision calibrated feed control — and anti-friction table with hardened steel box-type ways riding on hardened steel rollers.

Completely modern in every detail, this machine offers a low-cost solution to your rotary grinder obsolescence problems, or to the equally serious problem of tieing up a bigger machine on work than can be handled more easily and economically on the 161. Ask your Heald engineer for complete information, or send for Bulletin No. 2-161-1.

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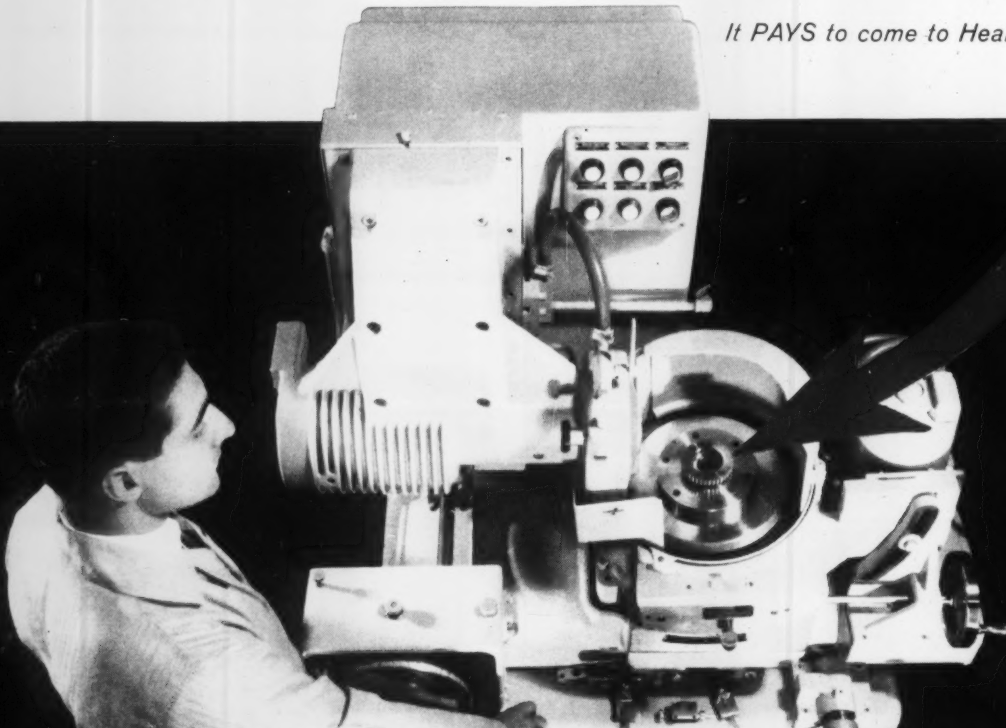

HEALD®

This Week in STEEL

The Metalworking Weekly

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Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED DEC. 5	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	165†	158	111	157

†Preliminary.

Less than a month after the steelworkers returned to the mills, STEEL's industrial production index is back to the level prevailing immediately preceding the strike. It will continue to climb, setting a record this month.

Details on Page 79

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED DEC. 12	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled .... (Source: Ward's Automotive Reports.)	70,000*	54,269†	64,230	137,882

*Estimated.

†Preliminary.

Total output of passenger cars in the fourth quarter will be only 1.2 million, the poorest showing since 1951. But motordom is getting set to jump its schedules a notch or two this month as steel comes rolling in.

Details on Page 76

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED DEC. 13	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	2,690*	2,650	1,291	1,985
Index (1947-49=100)	167.5*	165.0	80.4	123.6
Percentage of capacity	95.0*	93.6	45.6	73.5

*Estimated by STEEL; comparative figures reported by AISI.

Output of ingots established an all time high last week, surpassing the previous high of 2,657,000 tons for the week ended Apr. 19. The push to still higher levels may be hampered by maintenance work.

Details on Page 142

STEEL SCRAP PRICE COMPOSITE

	DEC. 9	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$42.83	$42.67	$45.33	$39.17

The market for steelmaking grades is firmer. It is supported by expectations for heavier buying by mills to sustain high furnace operations and to build stocks for winter consumption.

Details on Page 154

FINISHED STEEL PRICE INDEX

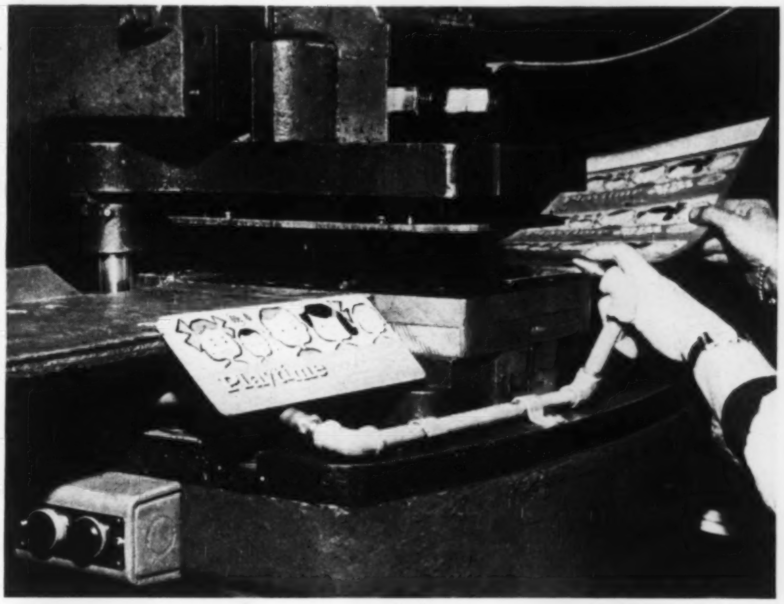
	DEC. 8	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.8	186.8	186.8	186.9

With the domestic market stabilized, interest centers in foreign steel offerings. A final industry-union settlement likely would result in a sharp price reduction on substantial tonnages of imported products.

Details on Page 143

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation



Lehigh H Teams Up with Brake Die

Result: 150,000 Box Tops

The job was a tricky one. It called for the blanking and forming of .010-in. black plate into hinged tops for children's paint boxes. But with the black plate already lithographed, it was imperative to avoid marring the material.

The manufacturer, Sobel Metal Products Co., Easton, Pa., talked it over with his local Bethlehem tool steel distributor, Luria Steel Supply Co., Catasauqua, Pa. The Luria representative proposed the use of Lehigh H for the die, and Brake Die for the punch. This proved a wise choice, for combined, the two tool steel grades turned out 150,000 pieces without any need for redressing. And the black plate received nary a scratch.

Bethlehem Lehigh H (AISI D-2) is our easy machining high-carbon, high-chrome tool steel. It is an air-hardening grade, with plenty of wear-resistance thanks to its excellent carbide distribution. Brake Die, a grade of special analysis steel, is oil quenched and tempered to develop the mechanical properties needed for maximum wear and toughness.

Bethlehem regularly produces about 30 different grades of tool steel—a range so wide as to meet virtually every requirement. For full information, call your Bethlehem tool steel distributor.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Hot-Work Tools Last Longer When Thermal Stress Is Reduced

Deterioration of hot-work tools in service by heat checking or cracking depends largely on the severity of thermal stress developed in service. Anything which can be done to decrease the magnitude of the thermal stress will increase the service life of the tools.

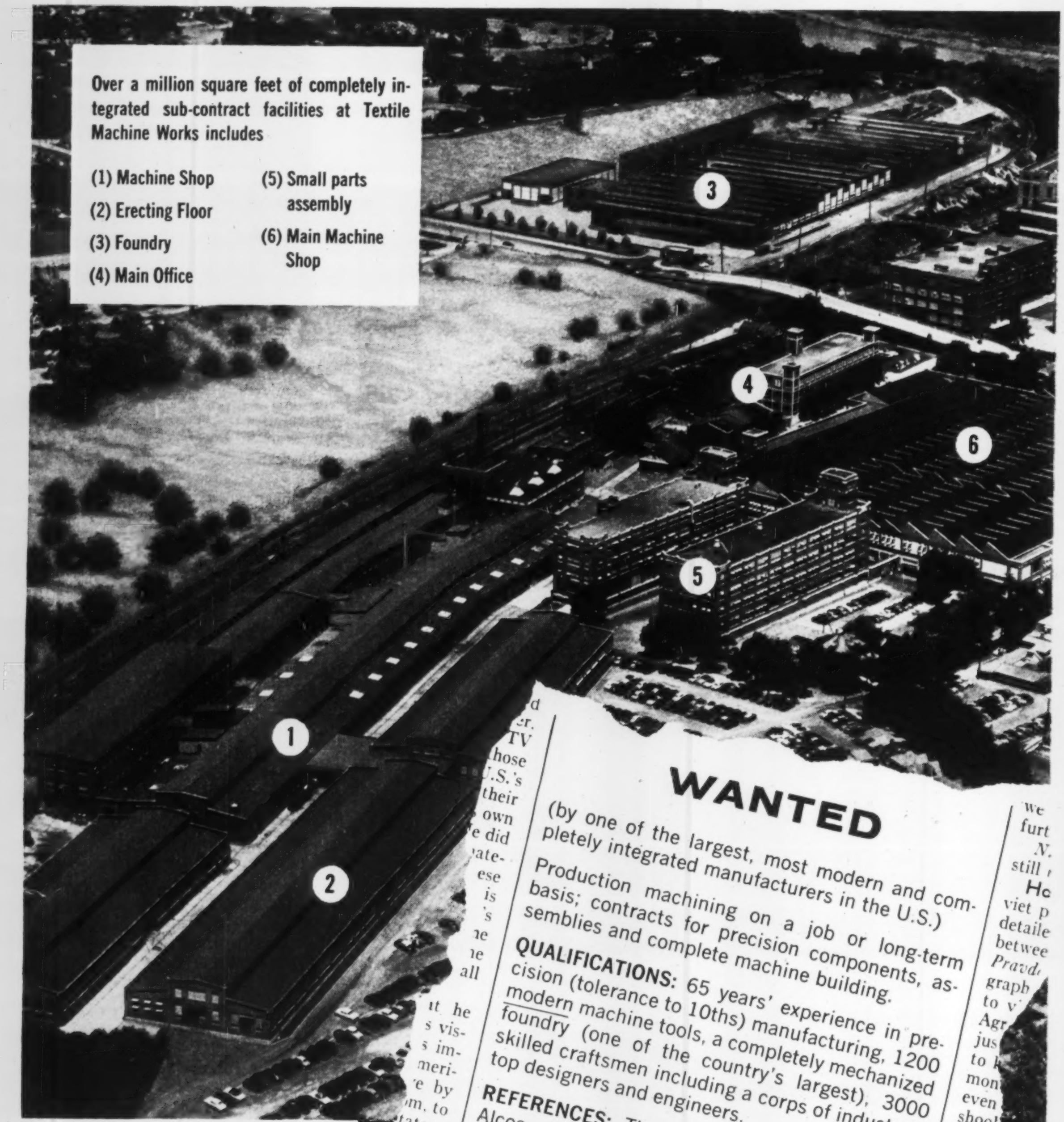
One of the most essential steps in using hot-work tools is to preheat them to their normal working temperature before use. This seemingly insignificant step will often improve the tool life appreciably because it decreases the severity of the initial stress cycles.

The provision of multiple tools which are used in succession is another simple way to decrease thermal stresses on certain types of hot-work tools. For example, on piercing operations the press may be provided with as many as six piercing punches mounted on an indexing fixture. After each piercing operation a different punch is moved into position for the next operation. This permits each punch to cool during the time of the next five operations, greatly reducing the severity of thermal stress. The service life of punches used in this manner is often twice that of punches used continuously in the same operation.

Air-4 hardens in air at 1550F.

With AIR-4 You Get Air-Hardening at Low Temperatures ... FREE MACHINING ... EXCELLENT WEAR

Air-4, Bethlehem's new medium-alloy tool steel, hardens in air at 1550F, and has excellent free-machining properties due to its carefully controlled addition of lead. It has exceptional wear-resistance and high toughness. Moreover, it can be heat-treated with complete freedom from the dangers of cracking. Ask your Bethlehem tool steel distributor for complete information on Air-4.



Over a million square feet of completely integrated sub-contract facilities at Textile Machine Works includes

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- (5) Small parts assembly
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For more details, or for new Facilities File Folder call or write today.

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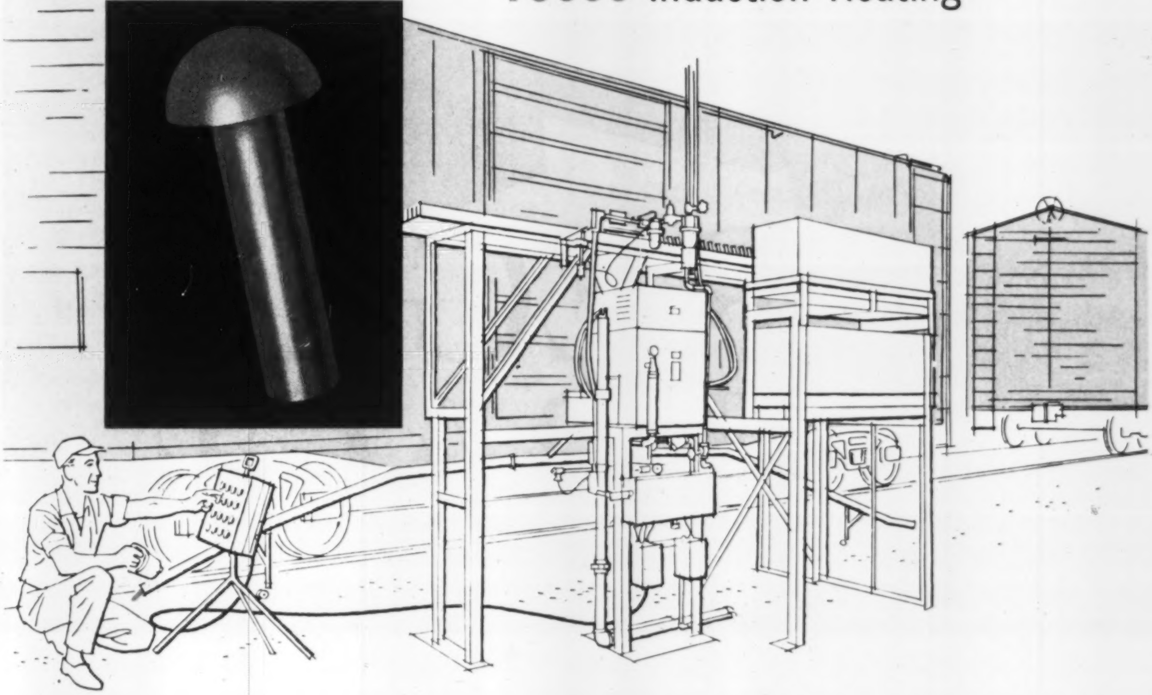
CONTRACT DIVISION, READING, PENNA.

Close-up of TOCCO Work Station for heating rivets.

Rivets are heated to 1900° F. in just 15½ seconds.

How a Major Railroad Saves OVER $17,000 PER YEAR with TOCCO Induction Heating



Rivets are delivered to the riveter at the right temperature, at the right time, and of the right size. This headwaiter for rivet-hungry box cars is a TOCCO Induction Heating Unit with ingenious tooling that selects the proper one of 10 sizes of rivets and shoots it to the riveter in seconds.

Savings in Labor—User reports a whopping labor savings of 6240 man hours per year since installing TOCCO.

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If you are seeking ways to speed production and lower costs, look to TOCCO for economical heating for forging, heat-treating, or brazing.

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Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

December 14, 1959

A Glance in a Mirror

Miss Irene Potoczniak, a student at Alliance College, Cambridge Springs, Pa., is preparing a paper on the steel strike, and she wrote to us for research material. Her letter set us off on a quest.

STEEL's editors believe that their province lies in looking ahead, not backward, but with the feeling that yearend review is good for the editorial soul, we decided to check out the volume of copy on the strike produced by the editors.

Here's the box score since Dec. 1, 1958:
Editorials—16
Articles—162
Total Weight—2 lb 1 oz.

Impact is a better yardstick than poundage, and the next letter gives us an idea of how strong the impact can be.

How the Word Travels

During the steel strike, Chicago Editor Erle Ross was consulted frequently by the Chicago office of the U. S. Department of Commerce.

This letter from George C. Payne, field office manager, Commerce Department, explains the confabs: "Just a line of grateful appreciation for the patient co-operation you and members of your organization extended during the many weeks of the steel strike . . .

"Your fine assistance enabled us to provide to the Secretary of Commerce, and in turn to the White House, highly important information on the effect of the strike and its relation to the industrial economy and the nation's defense program."

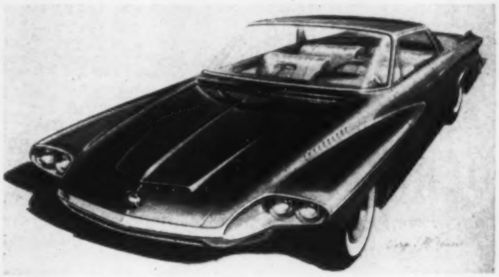
Colorful Addresses Dept.

Associate Editor Frank Briggs has been getting news releases from Astrometals Corp., Helzapoppin Way, Hawthorne, N. J.

Competition in Miniature

This is a story of competition that'll never make headlines. It involves missile models which are designed as office accouterment for Pentagon brass.

Two competing companies had government contracts for birds, but one waited to place contracts for miniatures until it had measured the competitor's models. Its explanation: "No general will ever look up from his desk to see our missile dwarfed by what's really a smaller bird."



Virgil Exner's Hallmark . . .

. . . The wedge or dart shape is evident in the smooth elegance of this dream car rendering by the Chrysler Corp. vice president and director of styling.

Full color prints of the car will go to five runners-up in STEEL's Beat-the-Experts contest. All you do is estimate the number of U. S. passenger cars that will be built in the first half of calendar 1960; enter your guess on the coupon in this department; and mail your entry.

We asked Mr. Exner how he goes about styling a car—does he start with a concept or details? "Cars must express a feeling—a dart shape, a continental appearance, or give the feel of an aircraft," he said. "We have to get the over-all feeling first. I never think of a grille, for example, until I have the complete concept pretty well in hand. After all, if the rest of the car is poorly shaped and executed, a new face can't save it."

We inquired about details. "I think perhaps we've gone as far as we should in exploiting rear end treatments, unless of course, you happen to have a rear engine car. Taillights are overemphasized today. I believe we should concentrate on different areas, like grilles, in the future. You'll notice we didn't exploit fins on this car, but we do have a bit of that feel. I think cars need a lift in the rear to give them that poised attitude."

Mr. Exner hints that Chrysler will continue the wedge theme. He says the basic shape can

I believe ____________ automobiles will be produced in the U. S. from Jan. 1 through June 30, 1960.

Mail this to:

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Penton Bldg.
Cleveland 13,
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YODER also makes a complete line of Cold Roll-Forming equipment and Pipe and Tube Mills. To profit from YODER'S years of engineering and service experience, contact your local YODER representative or send for the fully illustrated descriptive, YODER Slitter Manual; it's yours for the asking. Write to

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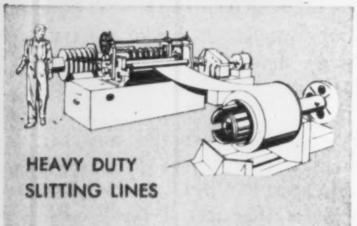
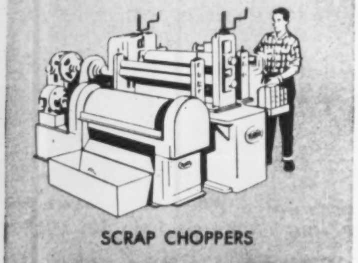




ENGINEERING YODER MANUFACTURING

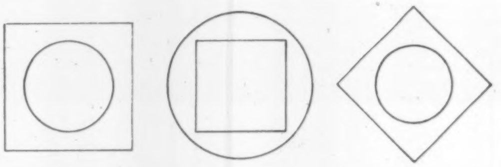
ROTARY SLITTING LINES

evolve into several different silhouettes. "The heavier mass is over the rear wheels where I think it belongs. The lower hood and forward slope all give a dart look to the car. You see this in most of our dream cars. We also use the classic theme to make styling simplified and clean. More glass helps—it gives a lighter effect above and the impression of a strong body below."

He notes: "Most people like to sit low; they get a feeling of security. From a styling standpoint, it would be desirable for cars to be still lower—if designers and engineers can devise ways to get people in comfortably." He thinks it's possible for cars to get 3 to 4 inches lower (lowest now is 52 in.), but it may take longer than the previous move from around 60 in. to the 53-54 in. which is typical today.

Cars of the next decade? "I hope they will be more simply styled and that there will be an effort made to return to or to strengthen what I'd call the automotive feeling. We must approach car styling with the thought that this is a moving vehicle and not just a product like a refrigerator, stove, or some package to be sold. That's a static approach. There seems to be a trend in that direction, and I hope we can get away from it." He sums up: "Cars should be exciting to look at as well as to drive and handle."

The best guesser in our contest will win two weeks free use of any one of the 19 cars made by Ford Div., Ford Motor Co. It could be you. Better clip the coupon today. The contest closes at midnight, Dec. 31, 1959.



How Creative Are You?

If someone asked you to create designs with the circle in a square figure to the left, above, how many could you draw? Psychologists indicate that possibilities are nearly infinite. Two samples are at the right. One creative fellow drew a clown—because no one limited the number of times or ways he could use the figures in a drawing.

The purpose? Researchers at the University of Chicago's Industrial Relations Center are testing the creative abilities of people with similar devices. The payoff is for industry, which depends upon creativity for everything from research and development to product packaging.

Associate Managing Editor John Morgan talked with the people at the U of C as well as with a number of metalworking managers to find out "How to Develop Creative Talent." You'll be reading his findings in next week's STEEL.

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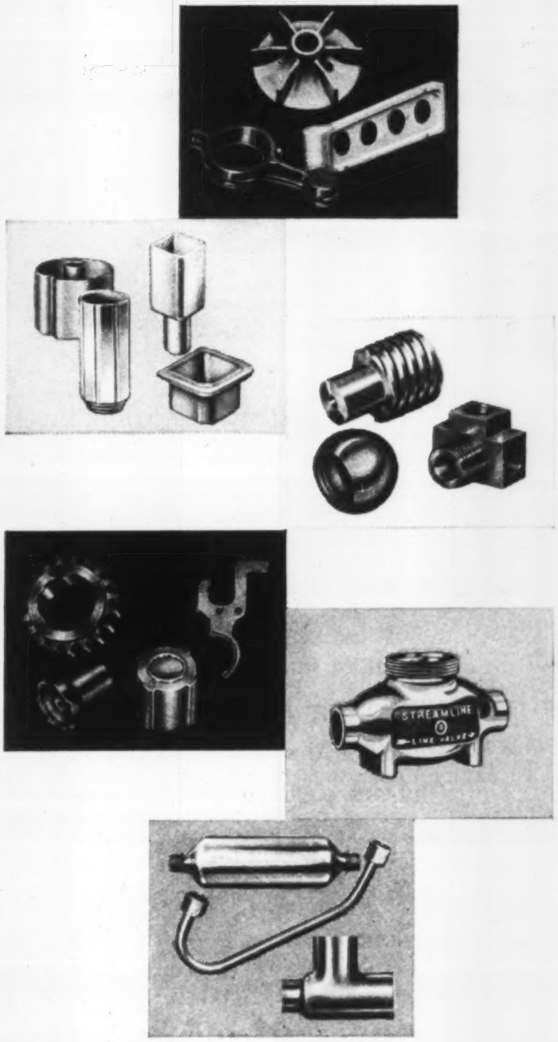

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The Mueller Brass Co. now offers "Cold-Prest" non-ferrous and ferrous impact extrusions. Flexible new facilities makes practical either long or short production runs of simple or complex shaped parts on an economical basis.

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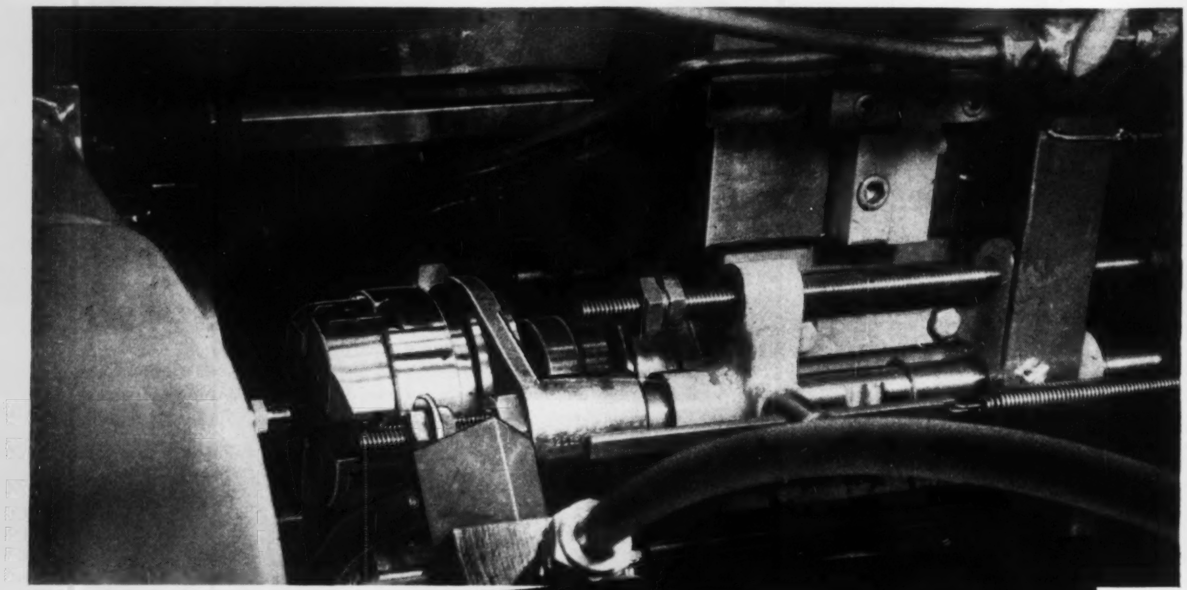

4500 PIECES BETWEEN GRINDS

. . . threading stainless steel on bar automatic

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7/16″ 20 pitch UNF threads were cut to Class 3 fit from 316 stainless steel by a 7LLL Head. 144 pieces per hour were threaded 5/16″ long within 3/32″ of a shoulder at 19 to 20 SFM. 4500 pieces were produced between chaser grinds using 30° short throat chasers.

This outstanding tool life is the result of basic chaser design and over 50 years of LANDIS research and experience in manufacture and hardening. For example, to ensure satisfactory die life, chasers are given special hardening when workpiece design or material specifications so indicate. Long life between grinds is one reason why the use of LANDIS Tangential Chasers ensures threading economy.

Let us show you how to improve threading operations—send specifications and ask for Bulletin F-80.

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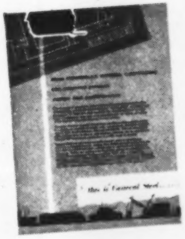

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LEWELLEN

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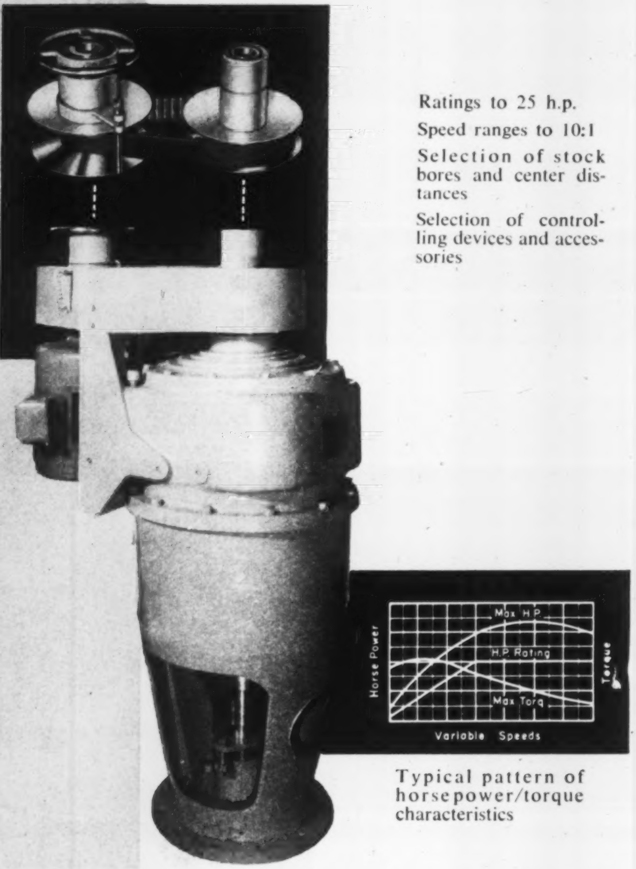

Ratings to 25 h.p.

Speed ranges to 10:1

Selection of stock bores and center distances

Selection of controlling devices and accessories

Typical pattern of horsepower/torque characteristics

The shaft of a standard motor and the equipment input shaft mount the drive.

With an 1800 r.p.m. motor, any input speed from 500 to 4000 r.p.m. is available.

Handwheel adjusts speeds while running, without altering shaft center distance.

Shaft and bearing loads are normal. No thrust loads are imposed. No beefing or supporting structure is required.

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CALENDAR
OF MEETINGS

Dec. 15, **Material Handling Institute Inc.:** Annual meeting, Savoy-Hilton Hotel, New York. Information: Hanson & Shea Inc., 1 Gateway Center, Pittsburgh 22, Pa.

1960

Jan. 6-8, **American Management Association:** Special packaging conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.

Jan. 10-13, **Institute of Scrap Iron & Steel Inc.:** Annual meeting and exhibit, Fontainebleau Hotel, Miami Beach, Fla. Institute's address: 1729 H St. N.W., Washington 6, D. C. Executive vice president: Edwin C. Barringer.

Jan. 11-15, **Society of Automotive Engineers Inc.:** Annual meeting and engineering display, Sheraton-Cadillac and Statler-Hilton Hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Jan. 15, **Malleable Founders' Society:** Semiannual meeting, Sheraton-Cleveland Hotel, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio.

Jan. 18-19, **Industrial Heating Equipment Association:** Annual meeting, Warwick Hotel, Philadelphia. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Robert E. Fleming.

Jan. 18-21, **American Road Builders Association:** Annual convention and highway materials and services exhibit, Netherland-Hilton Hotel, Cincinnati. Association's address: 600 World Center Bldg., Washington 6, D. C Executive vice president: L. W. Prentiss.

Jan. 19-20, **Steel Shipping Containers Institute Inc.:** Winter meeting, St. Regis Hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Jan. 20-22, **American Management Association:** Research and development conference, Roosevelt Hotel, New York Association's address: 1515 Broadway, New York 36, N. Y.

Jan. 20-22, **Steel Plate Fabricators Association:** Annual meeting, Roosevelt Hotel, New Orleans. Association's address: 105 W. Madison St., Chicago 2, Ill. Secretary: J. Dwight Evans.

Jan. 21-22, **National Industrial Conference Board Inc.:** General session for all associates, Hotel Commodore, New York. Board's address: 460 Park Ave., New York 22, N. Y.

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Quality at a price you can afford...

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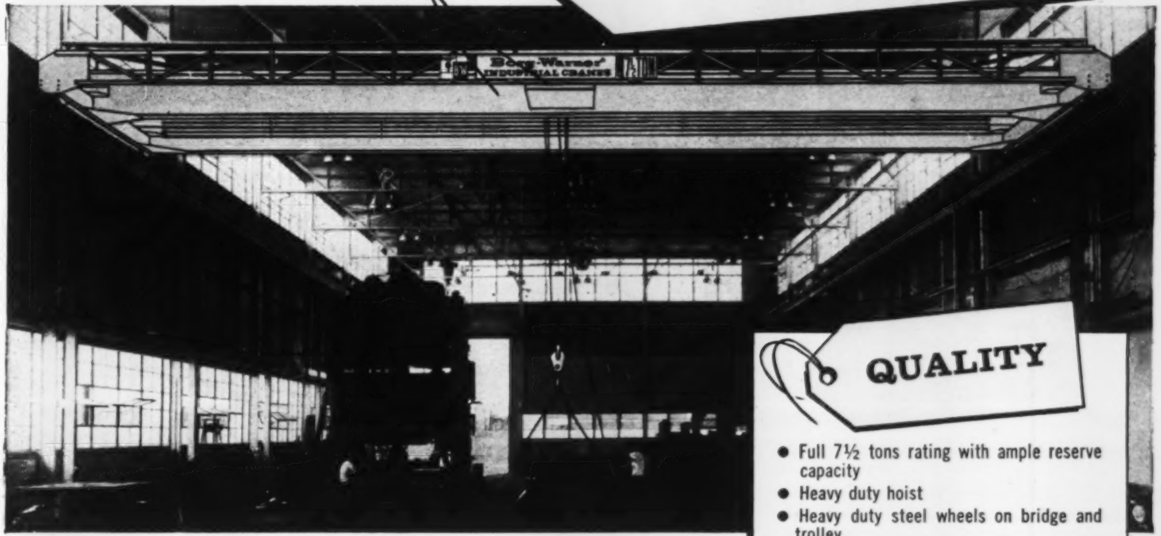
For a 7½-Ton, 60 Ft. Span, 3 Motor, Top-Running Double Girder Industrial Service Crane



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- Full 7½ tons rating with ample reserve capacity
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- Large gusset plates at end trucks
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- Fluid coupled bridge and trolley drives
- Full magnetic push button control
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The crane illustrated is a typical double girder installation. For shorter spans, smaller capacities and lighter or intermittent duty Borg-Warner Industrial Cranes can supply your needs at even lower prices.

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Value is determined by QUALITY *and* PRICE . . . and, a price like this for superior Borg-Warner Industrial Cranes construction and performance assures you of top value for your materials handling investment.

If you want to boost your production and operating profits by making full use of overhead space for materials handling . . . if you can use the extra storage space an overhead crane will provide as compared with fork-truck stacking . . . if you can benefit from aisles and work areas cleared of floor-type handling equipment . . . it will pay you to consider a Borg-Warner top-running, motor-driven crane like this. The cost may be far less than you had imagined. One crane owner thought it would cost him nearly four times this price to duplicate his crane.

Borg-Warner Industrial Cranes offers a complete line of overhead cranes . . . for light, medium or heavy service . . . constant or intermittent service at slow, medium or high speeds . . . operation from cab or floor. Get in touch with B-W Industrial Cranes today for answers to your materials handling problems.

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Finkl die blocks and forgings made of vacuum degassed steel*

*

REDUCE DOWNTIME

Finkl vacuum degassed steels result in die blocks, hot work die steels, and forgings with greater ductility and toughness. This means that size for size, and/or hardness for hardness, the degassed steel reduces the chances of breakage and excessive wear under severe operating conditions.

*

REDUCE MACHINING TIME

Finkl vacuum degassed steels are cleaner. About 50% of the nonmetallic inclusions have been removed. Machineability is improved, with higher lusters obtainable in die block impressions, if desired. Fewer tool regrinds are required.

*

ASSURE DELIVERY

Finkl vacuum degassed steels promote high density centers in large die blocks and forgings therefore reducing the possibility of late shipment because of ultrasonic rejection.

DIE BLOCKS · FORGINGS · ELECTRIC FURNACE STEELS · HOT WORK STEELS

F

For over 80 years Finkl has been producing top quality products. Now with the introduction of vacuum degassing of our electric furnace steels we have the most complete control of quality which enables us to offer the finest in die blocks, hot work die steels and flat die forgings. Call your Finkl representative.

A. Finkl & Sons Co.

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We can tell you the exact day when a particular Federal Ball Bearing is born. But the day when it turns its last revolution is generally far, far in the distant future. Building long life into bearings is no accident at Federal. It starts with the long-lived SAE 52100 steel we use. It continues through the scores of production and quality control steps along the way. And when a Federal Ball Bearing is finally boxed for shipment, it has a life expectancy that should please the most hardened purchasing agent. In fact, we are on amiable terms with many who represent America's top manufacturers. To understand why they like us, start by sending for our catalog.

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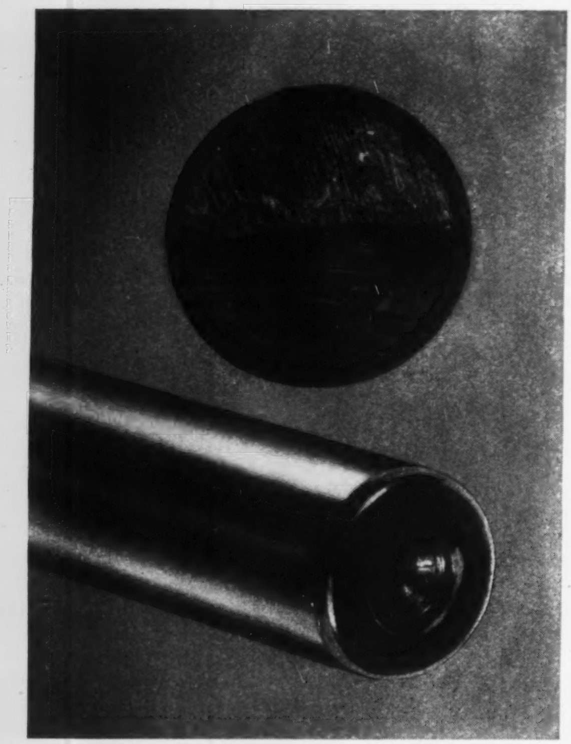
You benefit seven ways from Republic Steel Bar

SERVICE IN DEPTH



COLD DRAWN CARBON CORRECTED BARS HELP BRIGGS & STRATTON BOOST PISTON PIN PRODUCTION. The company was experiencing production difficulties and was not satisfied with piston pin quality from a performance standpoint. On the advice of a Republic Field Metallurgist, Briggs & Stratton switched to Republic C-1050 Cold Drawn Carbon Corrected Bars. The results were immediate. Production increased substantially. Rejects dropped to a minimum. Pin quality maintained at the highest level. Other advantages of Cold Drawn Carbon Corrected Bars include: Better machinability. Savings in both metal and money by eliminating waste. No need to buy bars oversize to allow for decarb removal. Photo shows finished piston pin used in Briggs & Stratton 1¾ to 3 hp engines. Note induction hardening in cutaway view.

Steel bar service in depth is an exclusive Republic concept, designed to help you solve steel bar problems and to benefit you these seven ways:

1. Facilities—Republic bar mills are strategically located in relation to major use areas. Hot rolled mills at Cleveland, Youngstown, Buffalo, Massillon, Chicago, Canton, Gadsden; cold finished mills at Massillon, Gary, Beaver Falls, Hartford, and Los Angeles.

2. Abilities—Republic's broad and specialized experience has been gained as the nation's number one producer of alloy and carbon bars, and leader in the production of special quality steels, such as forging bars.

3. Shapes and Sizes—Modern bar mills produce a complete range of sizes and materials—carbon, alloy, stainless, and titanium — in ¼″ to 10″ rounds, also squares, hexagons, octagons, flats, and special sections.

4. Variety—In addition to regular merchant quality, production includes coil spring and spring bar quality, cold heading and cold extrusion quality, high quality alloy and carbon steel bar products in heavier weight coils.

5. Quality—Republic combines quality control at every step of production with the most advanced features of bar mill design to meet today's exacting requirements for high quality steel bar products.

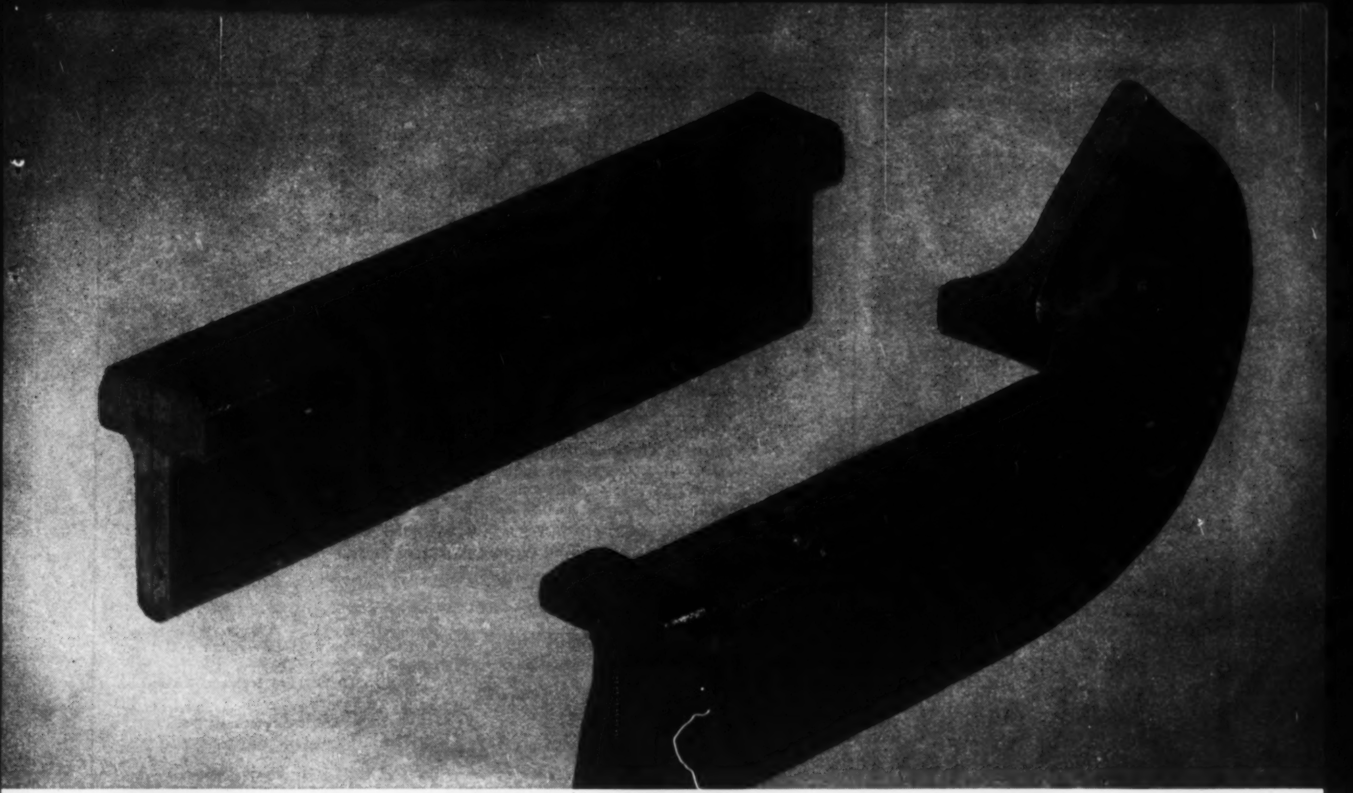
6. Dependability—Republic's aim has been to build capacity to provide more steel tonnage for existing customers as well as supply additional users. Assurances of steel to customers are real assurances. Orders are not taken by Republic unless capacity is available to fill them.

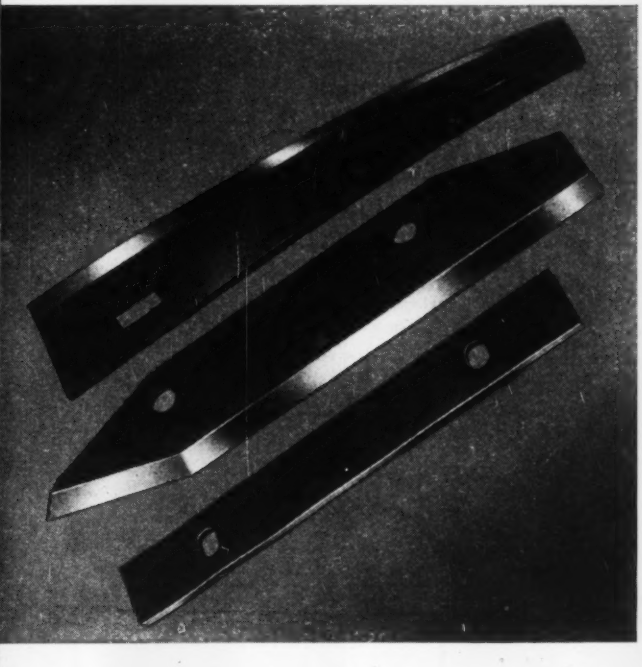
7. Metallurgical Service—Republic's famed 3-Dimension Metallurgical Service Teams—field, mill, and laboratory—are always available to help your personnel apply Republic's high quality bar products to your product. Carbon, alloy, stainless, and titanium metallurgists will assist in the selection, application, and processing of the right bar product for the job. No obligation. The coupon is your invitation to use this service.

Here are three examples of steel bar *service in depth.*

REPUBLIC

World's Widest Range of Standard Steels





REPUBLIC HOT ROLLED SPECIAL SECTION REDUCES COST on this rail anchor through elimination of most machining and forming operations. The special section is preformed to the predominating cross section of the part. If you design or produce steel parts you will be interested in these advantages of Republic Special Sections: (1) Almost limitless flexibility in design. (2) One-piece shapes replace costly assemblies. (3) Simplification of built-up, interlocking or associated parts. Republic Special Sections are available hot rolled or cold drawn in carbon, alloy, titanium, and stainless steel. Send coupon for full facts.

3-D METALLURGICAL SERVICE HELPS AGRICULTURAL KNIFE MANUFACTURER SLASH PRODUCTION COSTS. Lund Products Company, Maynard, Massachusetts, produces cutting knives for agricultural equipment. A quality product, Lund wanted to make them better to withstand even the most severe abuse. Republic metallurgists offered advice on practices and procedures in working alloy steels. The result? A superior cutting knife, produced at a substantial reduction in cost. 3-D Service is available to all steel users without obligation. Clip and mail coupon.

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Send more information on:
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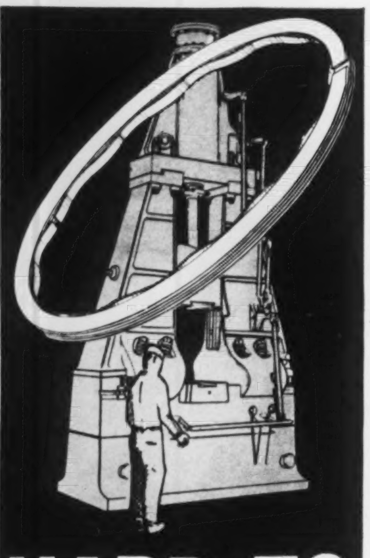

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But easy to prove:

Hammer Seal Rings in steam or air hammers have consistently lasted from 4 to 10 times as long as any other type ring.

Hammer Seal Rings are light-weight laminated rings with four high-tensile spring steel rails per groove. They are held firmly against the cylinder wall by an expander, even in worn cylinders.

The four 1/16" rails in each groove have rounded edges to prevent scuffing or scoring. Lightness of the rails (ounces instead of pounds) plus a film of oil between the rails positively prevents groove pounding.

Hammer Seal rings are manufactured for cylinders 6" to 48" in diameter. They have given continuous service for as long as 4 to 5 years in some of the nation's leading forge shops without breakage or maintenance, due to their unique design and high quality material.

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Have you sent for this FREE book and calculator?

Here is a new book, written in simple language, that describes the "Do's" and "Don'ts" in welding USS "T-1" Steel. Included in the booklet is a handy heat input circular computer that helps you choose the proper welding machine settings. Both will help every welder to do a more reliable job and make his work easier.

USS "T-1" Steel has become famous for three properties not usually found in a single steel: very high yield strength, excellent toughness and good weldability. The booklet will tell you how to weld "T-1" Steel successfully without affecting either its strength or toughness.

The information is based on the experience of our many field service men whose jobs are to help customers fabricate "T-1" Steel. It contains the results of nine years of work with hundreds of users, and shows how to apply common practices in the welding of "T-1" Steel.

As the booklet points out, welding of USS "T-1" Steel is not particularly difficult—but it is different than welding most other high-strength structural steels. To do it correctly requires some basic knowledge of the metal, of the electrodes, and the proper welding procedures.

We'll gladly send you enough free copies of the booklet for your weld shop personnel. Just send the coupon.

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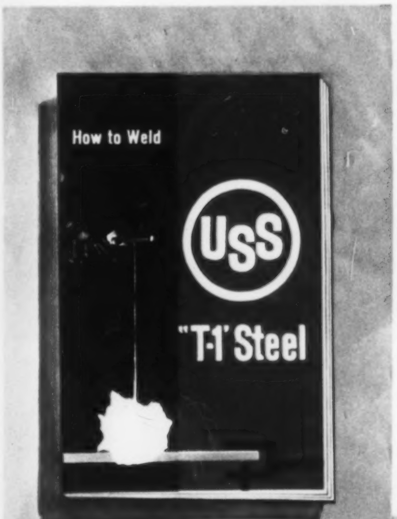

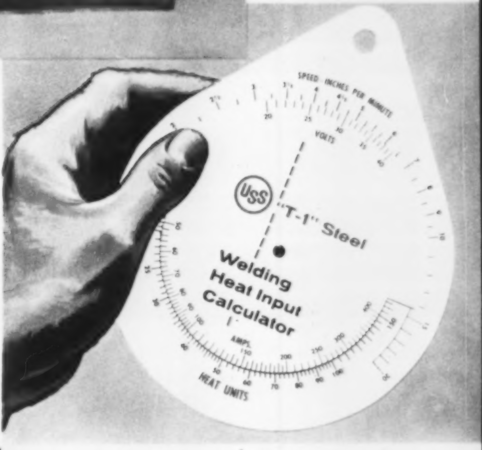

United States Steel
525 William Penn Place, Room 6038
Pittsburgh 30, Pa.

Gentlemen:

Please send me ______ copies of your new 24-page booklet, "How to Weld USS 'T-1' Steel," including the handy heat input calculator.

Name ______

Title ______

Address ______

Company ______

City ______ **Zone** ______ **State** ______

This is a space ship floor maker

Sometime within the next several years, the first American will soar into orbit around the earth. He will be sealed in a small, cone-shaped space capsule mounted atop an Atlas missile. The missile will climb 100 miles in less than six minutes, where the capsule will disengage and go into orbit. The man will be alone in space.

The vehicle for this historic voyage is already in production, under the auspices of the National Aeronautics and Space Administration's "Project Mercury." One of the possible methods of heat protection is a beryllium heat sink, forged on two giant steel dies. Both dies are USS Quality Steel Forgings. The top die (shown being rough-machined on one of our vertical boring mills) will be convex, 20 inches thick and will weigh 26,520 pounds. The bottom die, concave and 18 inches thick, weighs 27,700 pounds. Both are 92 inches in diameter.

The heat sink of the space capsule will also be its leading face when re-entering the atmosphere. It will be traveling 18,000 miles per hour, subject to thousands of degrees of temperature and many times the force of gravity. Naturally, it has to have superb strength and heat-resistant characteristics. By the same token, the dies that shaped the capsule floor had to be perfect.

After forging, both dies were subjected to preliminary heat treating and preliminary machining. Then came quenching and tempering. A battery of tests followed: ultrasonic inspection, tangential tensile tests, Charpy V notch impact tests, grain size tests, bend tests and magnetic particle inspection. Only then were the dies ready to take the incredible forging pressure, exerted by the giant hydraulic closed-die forging press where the beryllium disc was formed.

We invite your inquiries or requests for our free 32-page booklet on USS Quality Forgings. Just write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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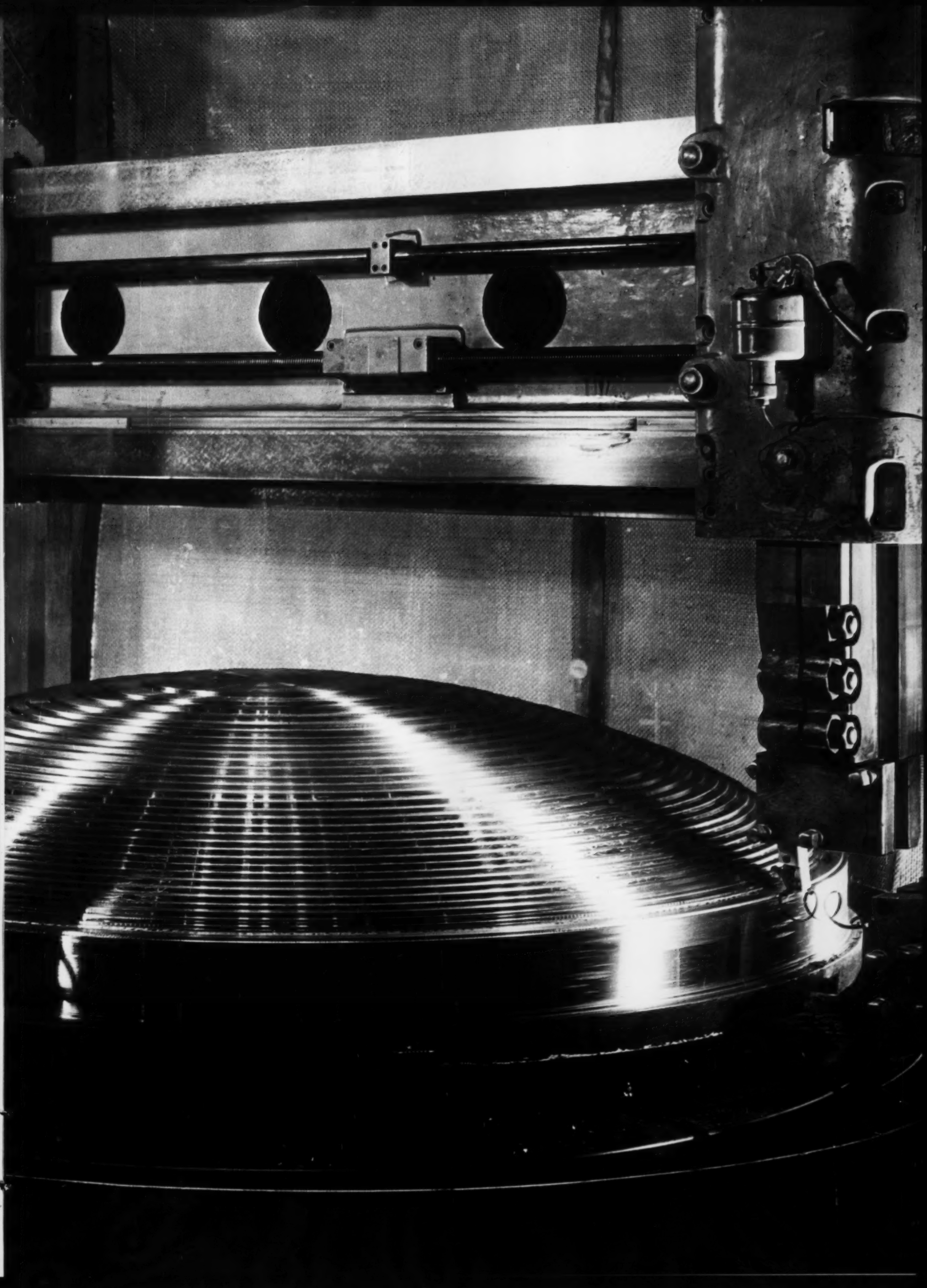

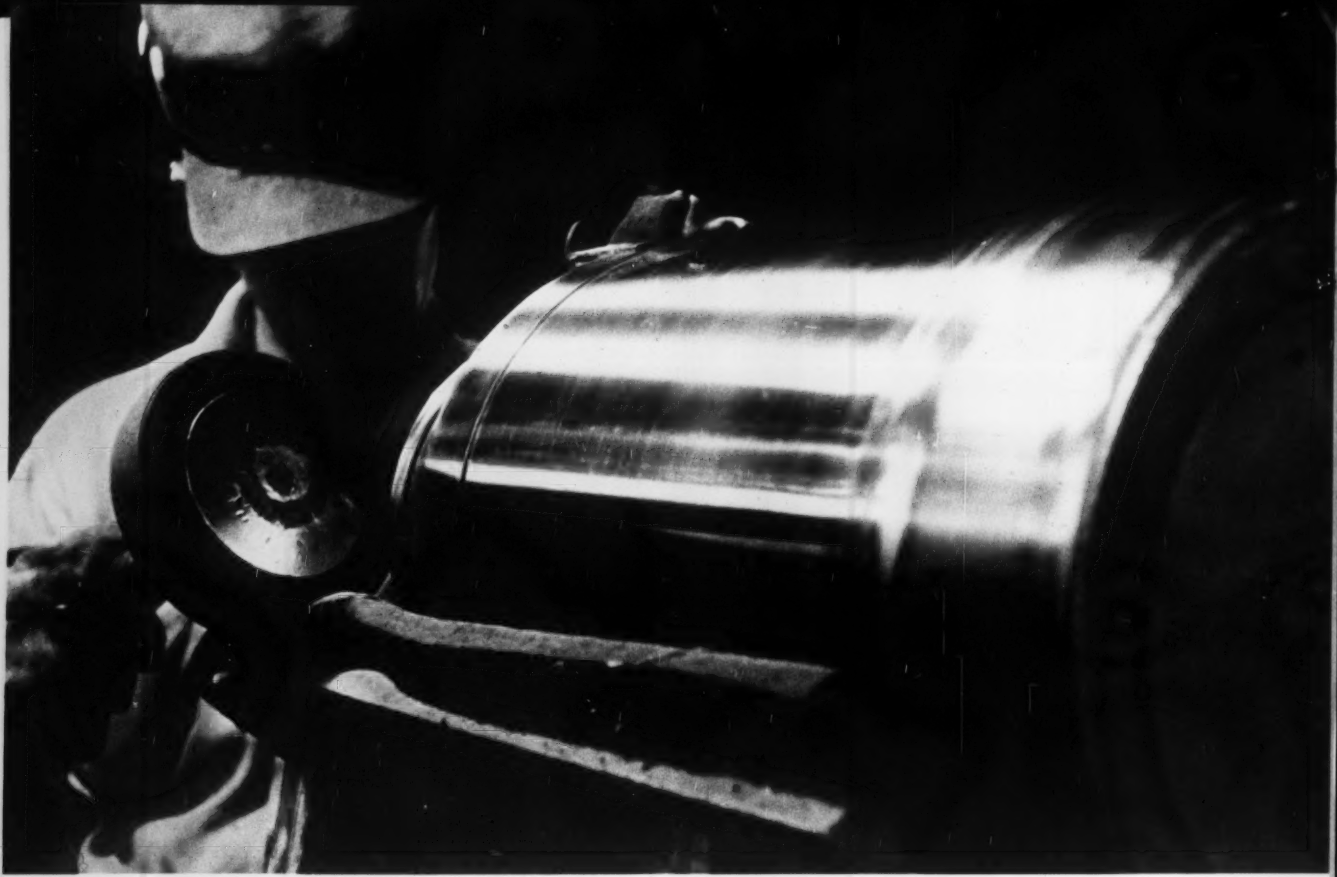

Wood proves Stainless Steel is simple to fabricate

General Sales Manager, C. Paul Carlson, points to the Stainless Steel milk cans designed and manufactured by the John Wood Company.

There's probably no one that has more experience and know-how with Stainless Steel fabrication than the John Wood Company. At eight different plants in the U. S. and Canada, the company makes everything from gasoline pumps to milk strainers. At their St. Paul plant they are equipped to produce 50% of the Stainless Steel can requirements for the entire dairy and dispenser industries.

The company worked closely with sanitation experts and health officials to design a Stainless Steel can that meets the strictest regulations for both material and workmanship. And at the same time, they found ways to simplify fabrication and save time and materials. They developed methods of hydraulic forming, welding, grinding and polishing that have paid off in lower costs and a quality product. These Stainless cans have a hard, durable finish that is easy to clean, ready for long, sanitary service. The John Wood Company proved that Stainless Steel isn't difficult to fabricate, it's just different.

If *you* would like to have complete information about working with Stainless Steel, write for a free copy of our *Stainless Steel Fabrication Book.* United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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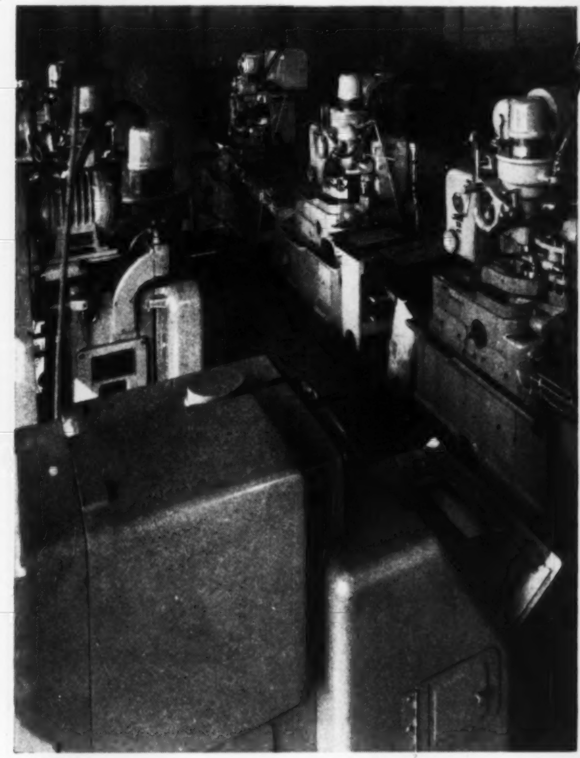
FELLOWS GEAR PRODUCTION EQUIPMENT

Builds Extra Quality at Lower Cost for STANLEY



View of production floor at Stanley Electric Tools, showing some of the Fellows Gear Production Equipment used.

Stanley is a name you know . . . a name that stands for high quality in electric tools.

To insure this quality, while providing the high production rates that mean lower costs, Stanley Electric Tools, Division of The Stanley Works at New Britain, Conn., uses Fellows Gear Production Equipment for shaping, shaving and inspecting the armature pinions for its electric tools.

Fellows has long been the leader in Gear Production Equipment, with machines for every gear production job: Fellows Gear Shapers, Pfauter Gear Hobbers, Fellows-Reishauer Gear Grinding Machines, Fellows Gear Shaving Machines and Fellows Inspection Instruments.

If you make gears of any size, from 1/16″ P.D. to 120″ P.D., Fellows' 60 years of experience can help you improve quality and cut costs. For complete information on Fellows Gear Production Equipment, call your nearest Fellows office.

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150 West Pleasant Avenue, Maywood, N. J.
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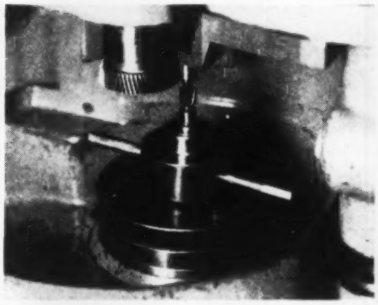
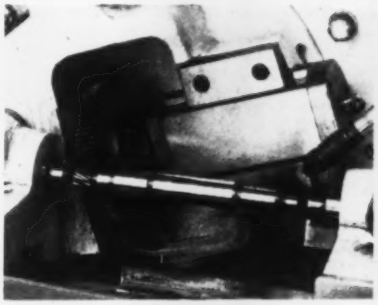
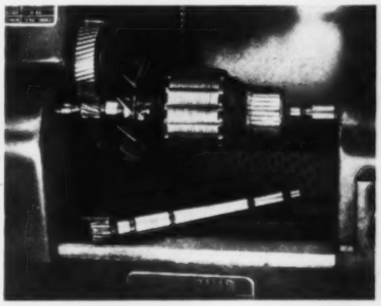


SHAPING. The versatile No. 7125 Fellows Gear Shaper gives Stanley high production speeds (up to 450 strokes per minute). It also provides fast, simple changeover from one job to another.



SHAVING. The No. 4 Fellows Fine Pitch Shaving Machine puts finishing touches on each pinion and adds the finish which results in long life and quiet operation.



INSPECTING. The No. 4 Fellows Fine Pitch Red Liner makes and records a composite check of gear accuracy, insuring high quality standards.

THE PRECISION LINE

Fellows *Gear Production Equipment*

Trailer axles take shape as automatic butt welder upset flash welds spindles to each end of 40-inch lengths of Pittsburgh Steel Co.'s mechanical tubing at Kenton, Ohio, plant of Rockwell-Standard's Transmission and Axle Division.

An Axle Axiom: Long Service Life

Pittsburgh Steel Company's Seamless Tubes Give Years of Service in Rockwell-Standard Corp.'s Trailer Axles

Mechanical tubing from Pittsburgh Steel Company covers a lot of ground —in truck trailer axles.

Pittsburgh Steel is a prime supplier of mechanical tubing to the Kenton, Ohio, trailer axle plant where the Transmission and Axle Division of Rockwell-Standard Corp. makes trailer axles for every major trailer manufacturer.

• **Uses C1040 Grade Tubing**— Rockwell-Standard uses AISI C 1040 grade hot rolled tubing, ranging from 4-inch outside diameter with a ⅜-inch wall thickness to tubing 6 inches in diameter with ½-inch wall.

Typical tubing shipped to Rockwell-Standard is made of fine grained steel in a uniform hardness range which enables the customer to develop the final physical properties he wants by heat treatment.

Pittsburgh Steel tubing performs satisfactorily in Rockwell-Standard's processing operations and satisfies the ultimate user—the trailer manufacturer —because we meet these requirements from tube to tube and from shipment to shipment.

Hardness is a prime requirement because lack of uniformity would require more costly operations at Rockwell. With Pittsburgh Steel tubes, heat treating can be standardized with predictable results.

Weldability scores high. Long service life of trailer axles demonstrates the weldability of Pittsburgh Steel's tubing. With an average of

Pittsburgh tubing, five inches in diameter, is being ground to 4.880 inches to meet specifications.

10 welds in every axle, welds have to be good. Strength and porosity tests prove they *are* good.

Freedom from scale helps promote predictable results from heat treating. Scale would produce steel with different rates of hardness after heat treating. No de-scaling operation is necessary with Pittsburgh Steel tubes.

Uniformity of wall thickness helps to prevent warping of axles in oil quenching and eliminates re-straightening in many cases or holds such operations to a minimum.

• **Tubing first is cut to length** by Rockwell to make axles which will track either 70 inches or 71½ inches, both standard widths. Forged spindles then are flash upset welded, one on each end of the tube. Welds are made simultaneously.

Next, tube and spindle assemblies pass through a high heat furnace on a moving conveyor. For the two hours each assembly is in the 60-foot long furnace it is subjected to a temperature of 1500 degrees F. Each 1½ minutes, an assembly emerges from the furnace to be oil quenched.

To temper the assemblies to the desired Brinell hardness, each passes through a draw furnace where it soaks for an hour in 1000 degrees F.

Rockwell-Standard wants a rating of 269 to 321 for spindles and 218 to 269 for tubing.

Axles then are cleaned by shot in a Wheelabrator and moved to the Machine Shop. Spindles are machined to final contours, welding flash is removed and threads are machine rolled.

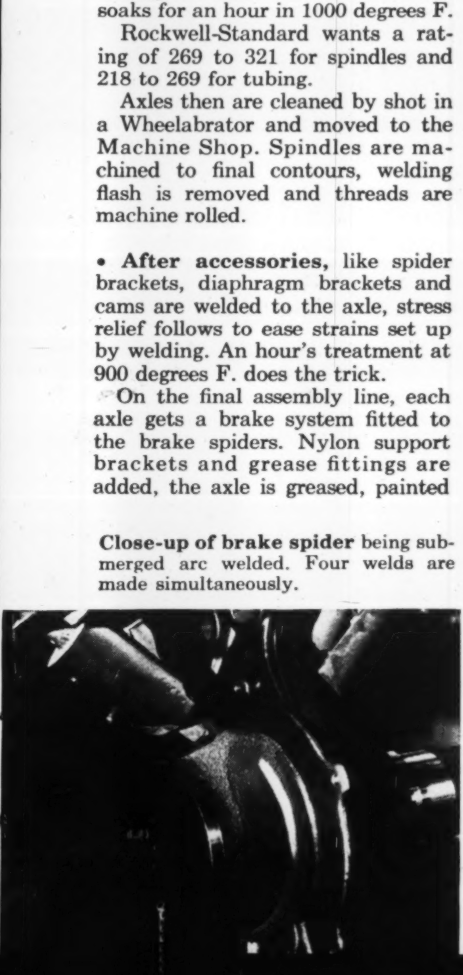
• **After accessories,** like spider brackets, diaphragm brackets and cams are welded to the axle, stress relief follows to ease strains set up by welding. An hour's treatment at 900 degrees F. does the trick.

On the final assembly line, each axle gets a brake system fitted to the brake spiders. Nylon support brackets and grease fittings are added, the axle is greased, painted and moved to the shipping platform.

You don't have to be a manufacturer of axles to enjoy the same benefits that Rockwell-Standard gets from Pittsburgh Steel tubing.

Any tube user who wants to lower production costs while making a better product can profit by using Pittsburgh Steel tubular specialties.

You get the physicals you want and you can expect better performance in fabrication. Talk to a Pittsburgh Steel man today. You'll find him in one of the district offices listed below.



Close-up of brake spider being submerged arc welded. Four welds are made simultaneously.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California
Chicago Tube & Iron Company
Chicago, Illinois
Cleveland Tool & Supply Co.
Cleveland, Ohio
Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada
Edgcomb Steel Company
Philadelphia, Pennsylvania
Gilmore Steel & Supply Co.
San Francisco, California
Earle M. Jorgensen Co.
Perry Kilsby, Inc.
Los Angeles, California
Mapes & Sprowl Steel Co.
Union, New Jersey
Metal Goods Corporation
St. Louis, Missouri
Miller Steel Company, Inc.
Hillside, New Jersey
A. B. Murray Co., Inc.
Elizabeth, New Jersey
C. A. Russell, Inc.
Houston, Texas
Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois
Solar Steel Corporation
Cleveland, Ohio
Steel Sales Corporation
Chicago, Illinois
Tubular Sales
Detroit, Michigan
Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

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This is a picture of a new product

It's nothing you can use in your plant tomorrow — or even next year. But Allis-Chalmers is working on it *now* to meet the needs of industry in the future.

Fundamental research of materials, processes and equipment is an important part of the A-C contribution to industry. *This enables product design engineers to make existing products even better, to create a continuous flow of new equipment, to help industry achieve new efficiencies and economies.*

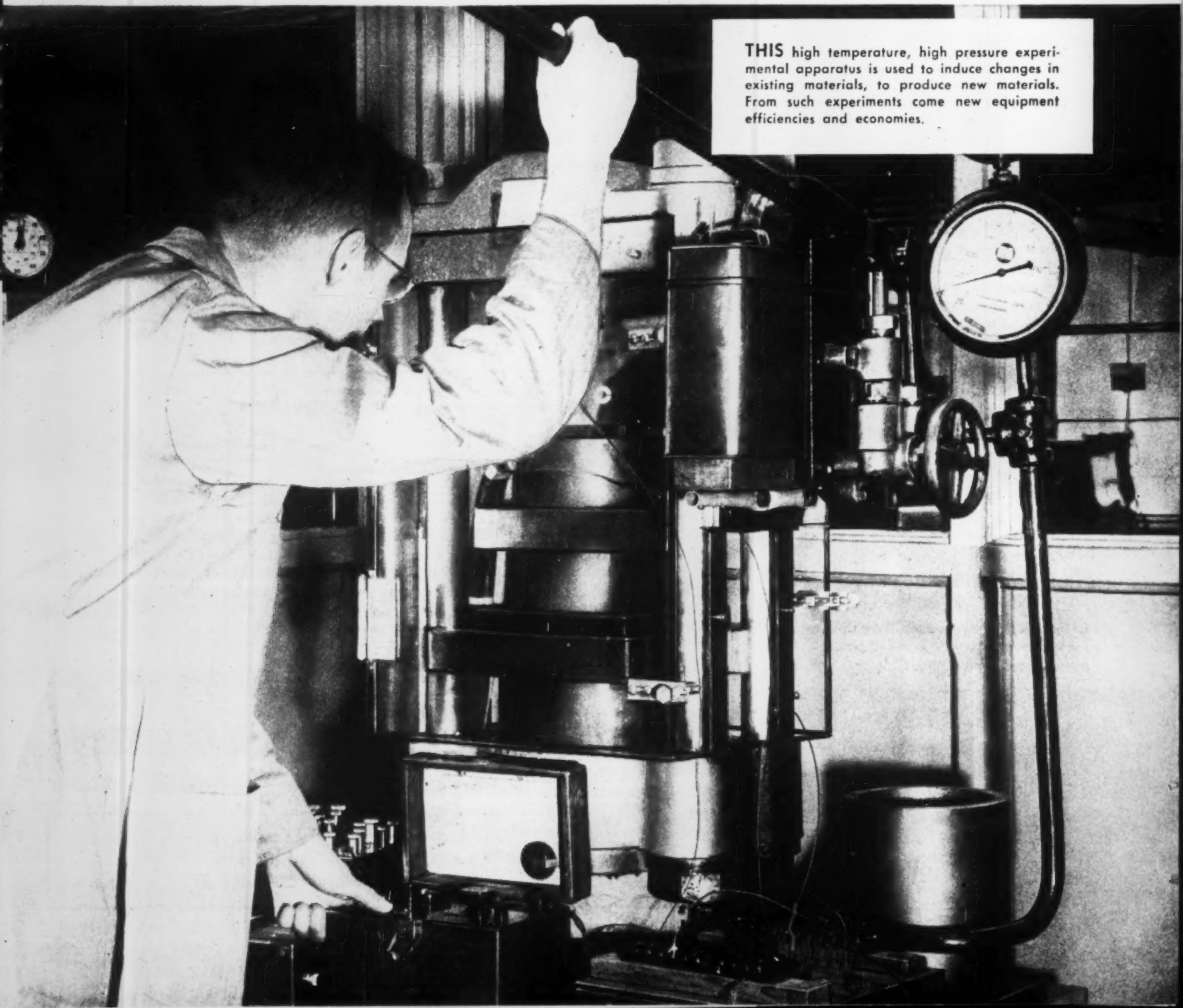
Research and development are only two reasons why A-C is recognized as a leader in supplying both electrical and mechanical equipment for industry. Single-source availability of "teamed" equipment, maximum engineering help and outstanding service facilities are others.

Talk *to your A-C representative or distributor soon about your requirements. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.*

Products for Industry: Electrical Generation, Distribution and Utilization Equipment; Pumps; Compressors; Mechanical Power Transmission Equipment; Processing Machinery; Motors and Control; Water Conditioning Systems, plus Materials Handling Equipment.

ALLIS-CHALMERS

A-1004-G1



THIS high temperature, high pressure experimental apparatus is used to induce changes in existing materials, to produce new materials. From such experiments come new equipment efficiencies and economies.

MAINTENANCE
DEPARTMENT

Hats off to the profit makers!

Maintenance departments are major profit makers. Here's why:

A 10% reduction in maintenance costs can result in a *4% jump in profits in the average plant*—according to latest Commerce Department figures.

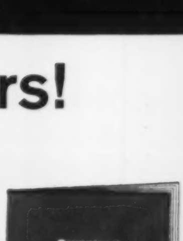
Increasing numbers of cost-conscious maintenance men are adopting Organized Lubrication as one of the proven ways to reduce costs. As Texaco Lubrication Engineers have demonstrated time and again, an Organized Lubrication program can *cut direct maintenance costs as much as 10%!* (Other benefits: more dependable production, reduced lube inventory, simplified purchasing.)

Managers throughout the U.S. who have installed and evaluated Organized Lubrication programs can testify to the profit gained.

Texaco Lubrication Engineers can offer help and helpful material to start an Organized Lubrication program in your plant. Why don't you look into it? Call our expert—or write for a copy of our book: "Organized Lubrication . . . Major Cost Control Factor."

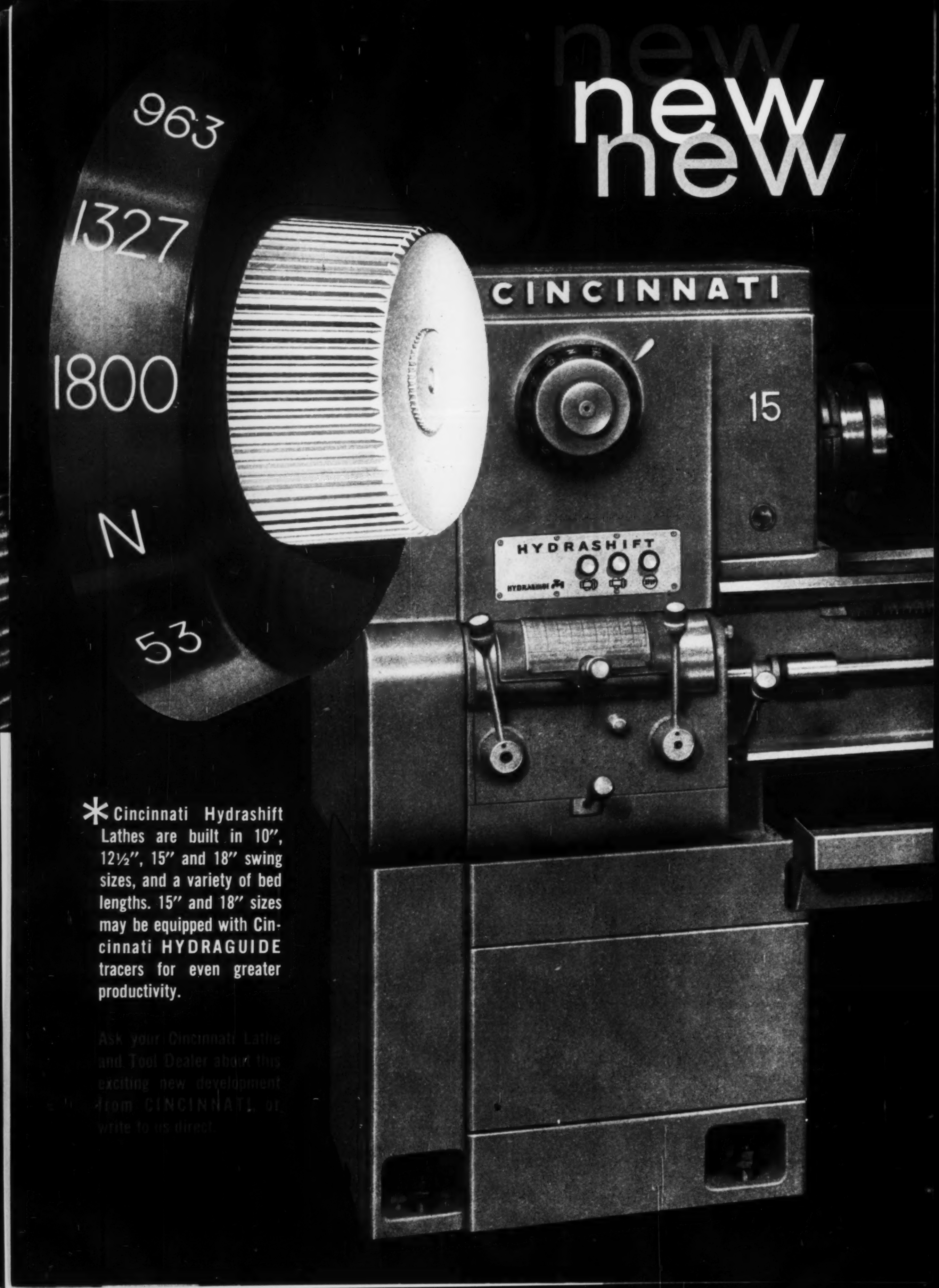
☆ ☆ ☆

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. S-131.



TEXACO

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL


new
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963
1327
1800
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53
CINCINNATI
15
HYDRASHIFT

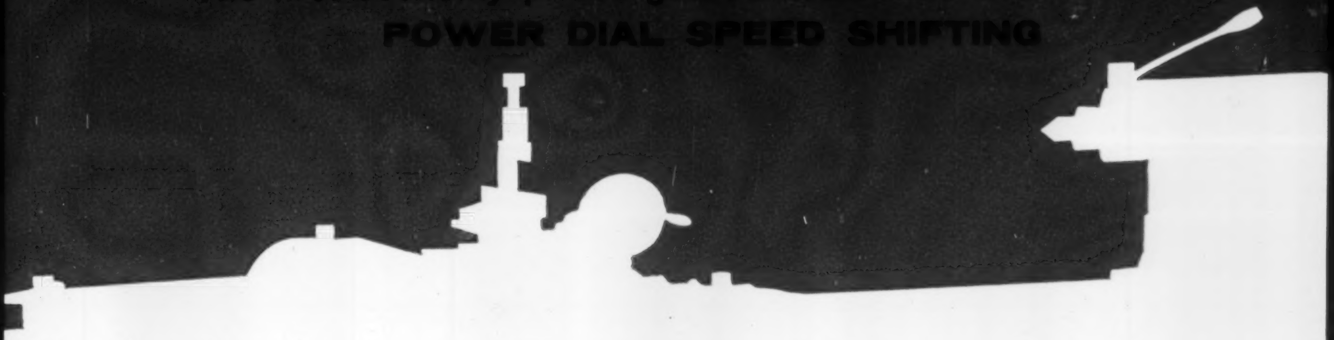
***** Cincinnati Hydrashift Lathes are built in 10″, 12½″, 15″ and 18″ swing sizes, and a variety of bed lengths. 15″ and 18″ sizes may be equipped with Cincinnati **HYDRAGUIDE** tracers for even greater productivity.

Ask your Cincinnati Lathe and Tool Dealer about this exciting new development from CINCINNATI, or write to us direct.

from cincinnati lathe and tool

CINCINNATI HYDRASHIFT*

The first economy-priced geared head lathe with POWER DIAL SPEED SHIFTING



HYDRAULIC POWER SUPPLIES THE MUSCLE ON NEW CINCINNATI HYDRASHIFT LATHES

Standard equipment on the new Cincinnati lathes includes HYDRASHIFT, the easiest and fastest method for spindle speed shifting on a geared head lathe. To change spindle speeds, the operator has only to dial the desired RPM . . . *hydraulic power supplies the muscle for the shift.*

New Cincinnati Hydrashift lathes are designed to provide more time for cutting and to reduce operator fatigue to a minimum. Yet, with their many new operating features, *they are still in the economy price class.*

new . . . FROM HEADSTOCK TO TAILSTOCK

new High Speeds with All-Geared Headstock—husky Hydrashift gearing provides 12 speeds in geometric progression up to 3000 RPM.

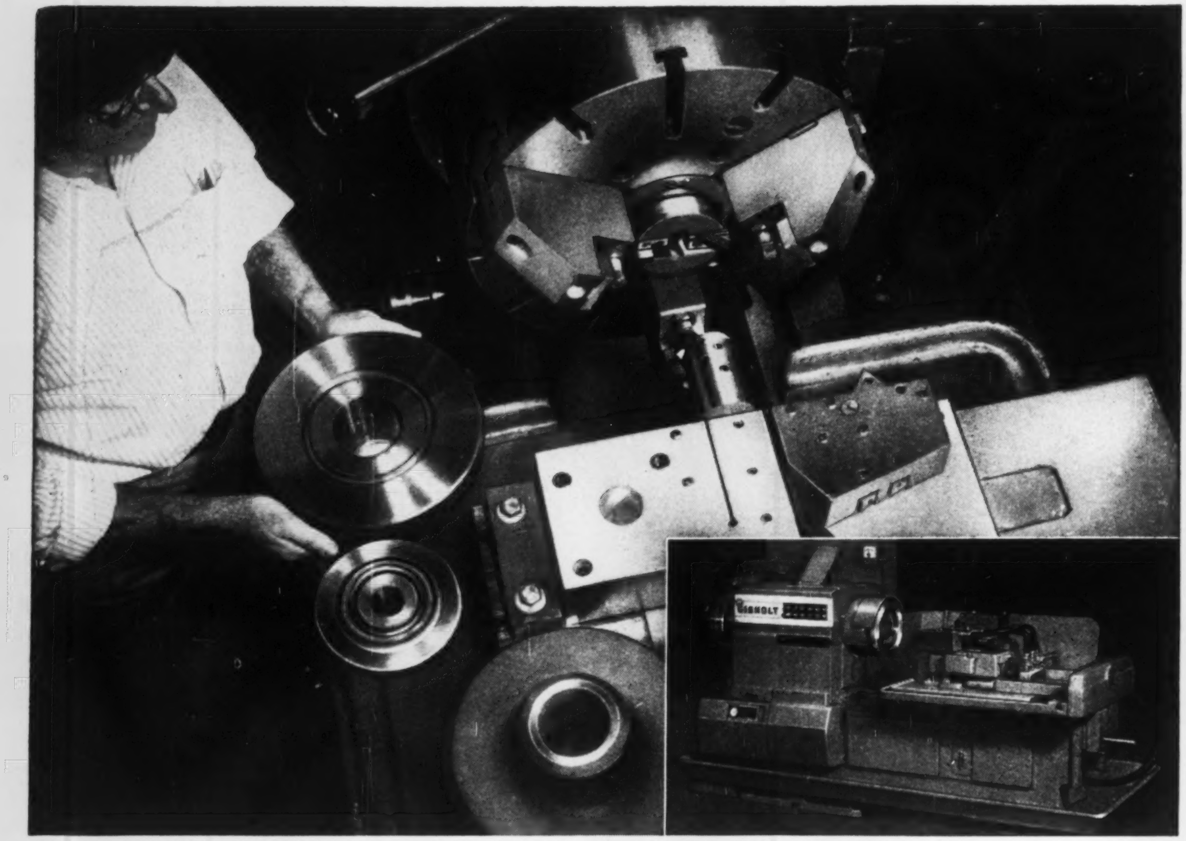
new Compound and Cross Slide—wider, stronger for heavy, high speed cuts; large, easy-read dials for greater accuracies with more operator speed and convenience.

new Quick-Clamping Tailstock—Cincinnati's unique tailstock design is even more versatile for fast tailstock positioning.

plus—NEW greater horsepower . . . NEW husky beds with "Hardclad" flame-hardened ways . . . NEW coded pushbutton controls . . . NEW chip pan (slides in and out for convenient cleaning) . . . Totally enclosed quick-change feed box with 48 threads and feeds . . . and many other exclusive features on the

**NEW
CINCINNATI
HYDRASHIFT
LATHES**

cincinnati lathe and tool co.
3207 Disney Street, Cincinnati 9, Ohio
"HYDRASHIFT" Lathes / "CINCINNATI" Drilling Machines / "SPIROPOINT" Drill Sharpeners



Smart planning on Simplimatic holds f.t.f. time to 1.7 min. on 6½" diam., 3.3 min. on 10¾" diam. workpieces.

How OTM Corp. cuts costs machining parts in 13 sizes

Handles each part in single chucking, using Simplimatic with back-facing attachments and two-speed motor

You may get ideas from the way OTM Corporation, Houston, Texas, machines steel welding neck flanges and welding necks—with each part in 13 different sizes—completing each part in a single chucking and holding change-over time to an absolute minimum.

Here's how the job is done on a Gisholt Simplimatic Automatic Lathe: Facing, grooving, boring and chamfering operations are performed from tools on short tool slides, with T-slotted tops for quick adjustment. Relieving the boring tool at the end of the cut eliminates tool tracks. Simultaneously, a special back-facing attachment works through the spindle to shave-face and chamfer the O.D. on the hub. A power chuck wrench operates the scroll chuck and permits mounting this attachment in the spindle bore. A two-speed motor provides correct surface speed and permits switching from high speed (for turning and facing) to low speed (for grooving operation) and back again, during the Simplimatic's automatic machining cycle.

Here, again, the Gisholt MASTERLINE Simplimatic Automatic Lathe saves a manufacturer the cost of a special machine. Its extra wide platen table provides ample space for an infinite number of slide and tool arrangements—and its table feed permits tools to engage with the work or perform additional machining operations before actual slide movements begin. Ask your Gisholt Representative to show you how the Simplimatic performs special machine functions at standard machine prices—on your product and under your production conditions.

MASTERLINE GISHOLT SINCE 1887

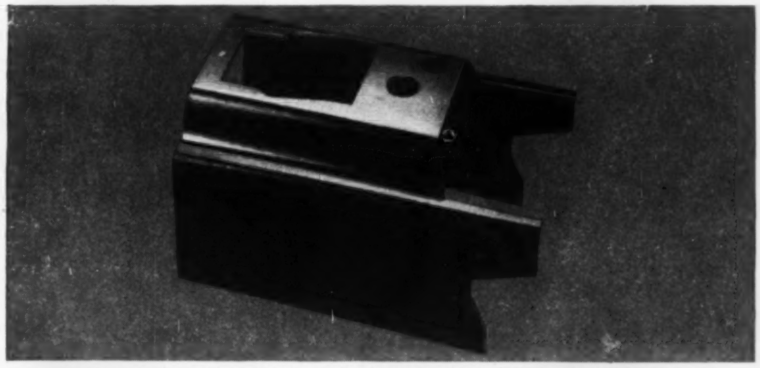
GISHOLT

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin, U.S.A.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

PROGRESS IN PLASTICS



Complex cover part made inexpensively from Dilecto grade XP—phenolic laminate with a kraft paper base.

POSTFORMING—THE INEXPENSIVE WAY TO MAKE COMPLICATED PARTS

How it's done. Briefly, postforming is effected by heating Dilecto stock until it is pliable, then placing it in an unheated, inexpensive mold, and pressing until the laminate cools enough to retain its shape.

Less expensive. Postforming is less expensive than other molding methods, because, generally, lower-cost dies and tools can be used. Frequently, dies can be constructed of wood or plastics rather than of tool steel. Also, retooling to meet new specifications is cheaper. Dies are more adaptable. Labor costs are reduced.

Why Dilecto? Dilecto laminates are excellent for postforming applications where the following qualities are required: high strength-weight ratios, superior electrical properties, and resistance to abrasion and weathering, moisture, and corrosion. Light weight is another major Dilecto asset.

Special Dilecto grades. Special Dilecto postforming grades respond to sharper bends and deeper draws, and take more complex contours without fracturing. However, most grades of Dilecto can be postformed to a limited extent. CDF Technical Bulletins 21 and 46 describe postforming grades in detail.

CDF silicone-rubber tapes insulate Electro-Flex heaters

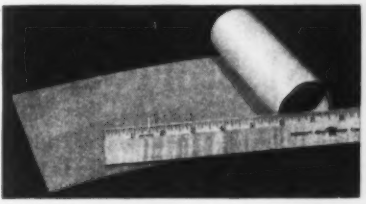
The bread of the "sandwich". Construction of Electro-Flex heaters consists of a vulcanized "sandwich" of silicone-rubber tape on both sides of patterns of resistance wire. Standard Electro-Flex heaters consist of four plies of CDF silicone-rubber tape (woven glass-fiber cloth with silicone-rubber calendered on). Each ply is .010-in. thick. For extreme flexibility, this CDF customer also makes a Hi-Flex (trade name) heater.

Heat up missiles and rockets. Electro-Flex heaters are on all U.S. missiles and rockets. Typical are the Atlas, Thor, and Redstone, where they heat pipes and valves in the fuel system. Industrial applications include storage-drum heaters, heat sealing, and oven heaters — particularly small crystal ovens. Request Bulletin SR-3.

Flexible Teflon-impregnated glass cloth

Combines advantages. Flexible new GB108TED combines the high tensile strength and resistance to flow typical of glass cloth laminates with the low permeability, excellent chemical resistance, and superior electrical properties of DuPont Teflon TFE fluorocarbon resin. It consists of glass cloth impregnated and covered on both sides with a continuous film of Teflon resin. An important advantage: freedom from pinholes.

Where it's used. GB108TED is suitable for corrosion-resistant parts like gaskets and seals. Also for electrical insulation like radar windows, flexible printed circuits, and tape cable. It shows unusually high tear-resistance, and can be formed into simple shapes. Request Bulletin GST-58A.



GB108TED is offered as continuous, natural-color, smooth-finish sheet in coils. Maximum width 6". Maximum length 75'.

NEW CDF LITERATURE • *Bulletins referred to in this advertisement may be obtained from your CDF representative, or you may send the coupon below, indicating the Bulletins you want.*

Please send me the following Technical Bulletin(s):

☐ Bulletins 11,110 and 11,140—CDF Postforming Grades

☐ Bulletin GST-58A—CDF Teflon-impregnated glass cloth

☐ Bulletin SR-3—CDF Silicone-Rubber tape

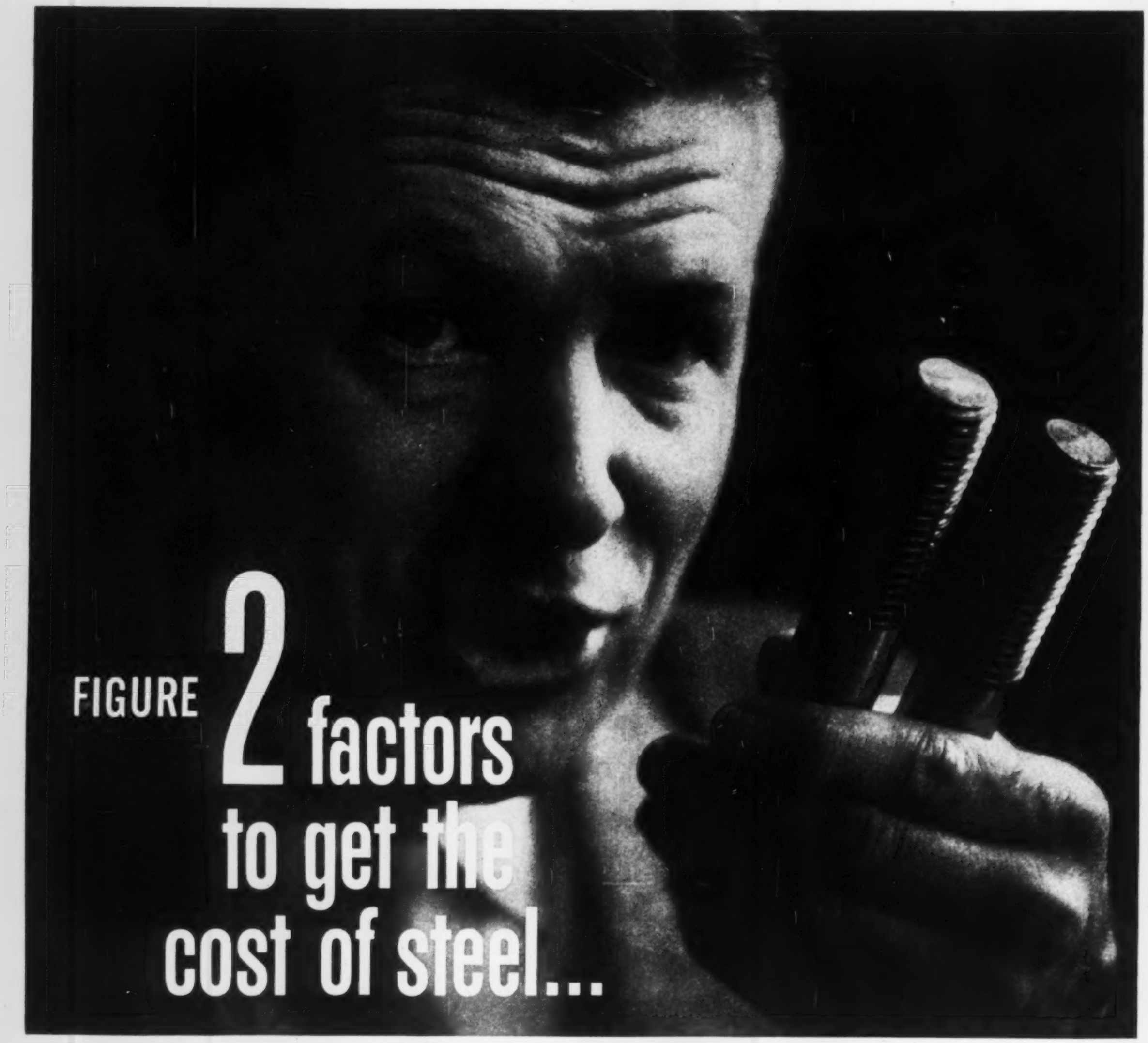
Name________________________**Title**________________

Company____

Street Address___________________________________

City______________________**Zone**_____**State**_______

CONTINENTAL-DIAMOND FIBRE
A SUBSIDIARY OF THE *Budd* COMPANY • NEWARK 22, DEL.
In Canada: 46 Hollinger Road, Toronto 16, Ontario



COST OF POSSESSION and delivered cost!

The high cost of possession may surprise you. It has surprised many a smart, informed steel user.

When your Steel Service Center performs first cutting operations you save operating and capital costs of the equipment it requires. You get steel delivered quickly from stock, ready for use. You save costs of storage and handling. You cut scrap loss and wastage.

There's a nearby Steel Service Center set up to serve you, not only with steel, but with technical know-how.

If you are buying more than three months' inventory because you think it's a bargain, compare *all* of your costs with the cost and *freedom from risk* of buying from your Steel Service Center. For more information, get the booklet, *What's Your Real Cost of Possession for Steel?* from your Steel Service Center. Or write to Steel Service Center Institute, Inc., 540-G Terminal Tower, Cleveland 13, Ohio.

STEEL
SERVICE CENTER
INSTITUTE

...YOUR STEEL SERVICE CENTER

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered ________
Cost of capital:
  Inventory ________
  Space ________
  Equipment ________
Cost of operation:
  Space ________
  Materials handling ________
  Cutting & burning ________
  Scrap & wastage ________
Other costs:
  Obsolescence ________
  Insurance ________
  Taxes ________
  Accounting ________
TOTAL ________

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered
TOTAL ________

A 3M Case History Report

POLISHING

STEEL POLISHING SPEEDED 10–15% WITH "PG" WHEELS

MANUFACTURER: Heintz Division of Kelsey-Hayes Co.
ADDRESS: Philadelphia, Pennsylvania.
PRODUCT MANUFACTURED: Automotive Metal Stampings.
3M ABRASIVE USED: "PG" Wheels.

HOW 3M ABRASIVES ARE USED: Finishing operation. Remove die marks, scratches, and other forming defects from cold-rolled carbon steel auto grille bars, prior to plating.

OPERATIONAL DATA ON 3M METHOD: Grit 220 Resin Bond Cloth "PG" Wheel on double-spindle floor lathe with buff-wheel.

OPERATIONAL DATA ON PREVIOUS METHOD: 2-station, 3-step method. 1st, #120 disc; 2nd, set-up wheel; 3rd, buff-wheel.

PROVEN ADVANTAGES OF 3M METHOD: Former 3-step operation reduced to 2 steps; "PG" Wheel and Buff. "PG" Wheel leaves no scratches on work piece; speeds production 10-15%.

OTHER 3M ABRASIVE PRODUCTS IN USE: "Three-M-ite" Resin Bond Cloth Portable "PG" Wheels on hand-grinders are used to remove in-use scratches, other imperfections from dies, without removing them from press. "PG" Wheels replaced hand methods, reduced repair time from 14 hours to 30 minutes.

WANT MORE INFORMATION? Send for free manual, "Modern Metal Finishing with 3M 'PG' Wheels." Write to 3M Co., St. Paul 6, Minn., Dept. ABH-129.

"PG" Wheels are manufactured in U.S.A by 3M Company, St. Paul 6, Minn. Export: 99 Park Avenue, New York. Canada: London, Ontario

WE RECOMMEND
How to use coated abrasives to cut costs improve production, shown in the new 426 page book
COATED ABRASIVES
MODERN TOOL OF INDUSTRY
At bookstores or McGraw Hill, N. Y.

3M Coated Abrasives

"PG" WHEELS

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

COFFING
Quik Lift
Electric Hoist

20 Models in Capacities from ¼ to 2 tons

COFFING
Quik Lift
COFFING
2
TON
COFFING

Workmen like the new Coffing Quik-Lift Electric Hoist because it is easy to operate and light to handle. The aluminum housing is in sections for quick access to change voltages, limit switch, type of suspension or chain. Moving the Quik-Lift from station to station in your plant is simple and fast. The pistol-grip push-button control station is made of non-conducting plastic. Its design permits up or down operation while pulling trolley mounted hoists. Power to the controls is reduced to 115 volts for added safety. For new hoist efficiency specify Coffing Quik-Lift. Your Coffing distributor has them in stock and will give you complete details, or write for Bulletin ADH-65.

DUFF-NORTON

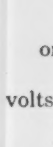
Pistol-Grip Push-Button Control

Lightweight Aluminum Housing

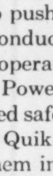
V-Type Brake for
Maximum Braking Surface

Easily Adjusted Limit Switch

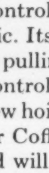
Complete Line of Accessories



RATCHET
LEVER
HOISTS

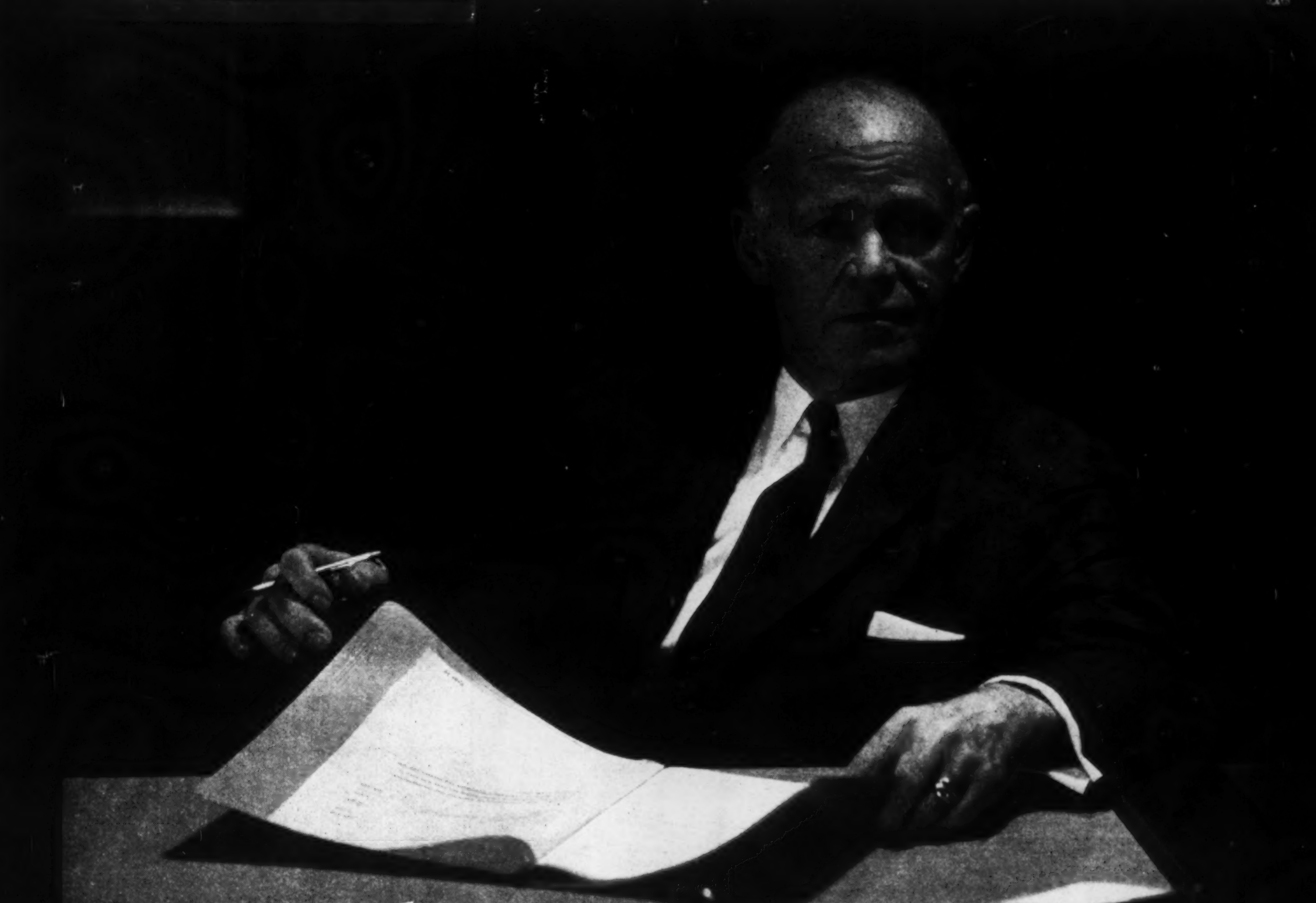


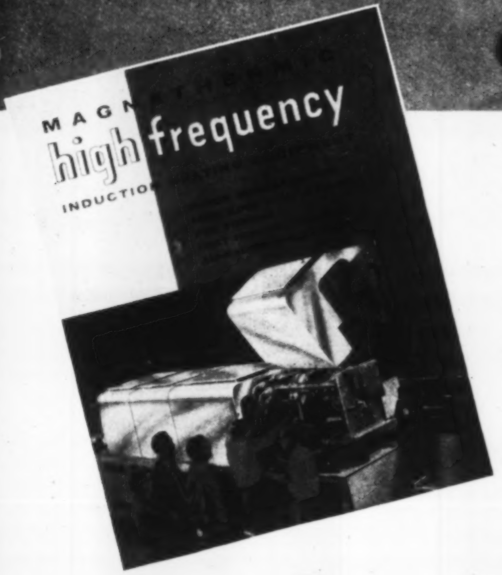
QUIK-LIFT
AIR
HOIST



CHAIN
HOISTS

COFFING HOIST
DIVISION OF
DUFF-NORTON COMPANY
813 Walter Street • Danville, Illinois





"I know Automatic Induction Heat Treating will cut my costs, *but WHO is the REAL AUTHORITY on the subject?*"

As the only fully integrated company for induction heating, Ajax Magnethermic can give unbiased recommendations on the best method of heating and the highest quality material and workmanship — all at competitive prices.

This company devotes all facilities and energies exclusively to induction heating . . . and has for many years. We know the heating and specifically the induction heating business.

We make equipment for all frequencies commercially practical. Your questions, inquiries or orders will be handled with intelligence, with authority and with dispatch.

Induction Heating is our **ONLY** *Business*

AJAX Magnethermic
CORPORATION

GENERAL OFFICES

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Ajax Park
Trenton 5, New Jersey

MAGNETHERMIC DIVISION
P. O. Box 839 • 3990 Simon Road
Youngstown 1, Ohio

AJAX ENGINEERING DIVISION
P. O. Box 1418 • Lalor & Hancock Streets
Trenton 7, New Jersey

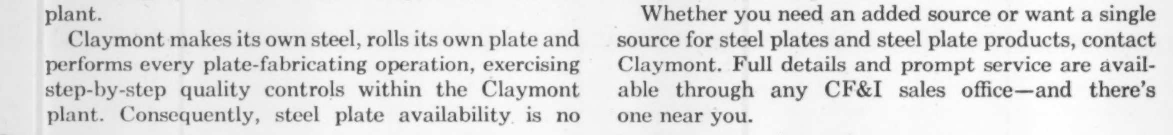
Remember CLAYMONT

TO fabricators and equipment manufacturers, the Image of CF&I means single-source service for many of their steel plate requirements. This giant steelman reflects the integrated steel production and plate fabricating facilities of CF&I's Claymont, Delaware plant.

Claymont makes its own steel, rolls its own plate and performs every plate-fabricating operation, exercising step-by-step quality controls within the Claymont plant. Consequently, steel plate availability is no problem, and customer specifications are met exactly.

Small or large-quantity orders are handled with equal facility. Quick shipments from stocks are available on many items, and delivery promises are kept on special-to-order production.

Whether you need an added source or want a single source for steel plates and steel plate products, contact Claymont. Full details and prompt service are available through any CF&I sales office—and there's one near you.



for steel plates . . . heads . . . fabricated plate products

Claymont Steel Plates

CARBON—to all standard ASTM and AISI specifications.

ALLOY—including nickel-bearing ASTM specifications A-203 and A-353 for liquid oxygen storage and other low temperature applications . . . "chrome-moly" ASTM specification A-387 (all grades) for high temperature and high pressure applications . . . as well as ASTM specifications A-202, A-204, A-225, A-302 and AISI specifications 4140 and 4130.

STAINLESS-CLAD—provides the same protection against corrosion, abrasion and contamination as solid stainless—*plus* the economy of carbon steel backing plates. Cladding and backing are inseparably bonded together. Claddings are available in thicknesses from 5% to 50% of total plate gage. AISI stainless specifications 304, 304L, 316, 316L, 316Cb, 321, 347, 405, 410, 430 are provided. ASTM A-263 and A-264 specifications can be supplied also.

CLAY-LOY high strength low alloy steel plates—comply with ASTM specification A-242. Ideal for structural and equipment applications where weight-saving is important.

CF&I LECTRO-CLAD nickel plated steel plates—give positive protection against product contamination and discoloration, at less cost than solid nickel.

Claymont Spun and Pressed Heads

Claymont has complete facilities to produce spun or pressed heads . . . in diameters from 9 inches to 19 feet . . . in gages from 3/16″ to 6″ . . . in the following shapes: standard or ASME flanged and dished, conical, hemispherical, elliptical, flanged and reverse dished, dished only, flared and dished, flanged and shallow dished, flanged only, and large segmented and welded shapes. Metals include carbon, alloy, stainless or stainless-clad steels; aluminum, aluminum alloy, brass, bronze, copper, Hastelloy, inconel, monel, and other ferrous and non-ferrous metals supplied by our customers.

Large stocks of the more popular sizes of Claymont Heads, flanged and dished in carbon steels, are maintained at the following CF&I warehouses:

Chicago • Claymont, Delaware • Houston • Los Angeles
San Leandro, California • Tulsa

Claymont also manufactures a complete line of fittings for pressure vessels, such as manhole and handhole fittings, elliptical manhole rings and storage tank manhole frames and covers.

Claymont Fabricated Steel Plate Products

Claymont's production-line fabrications shop is completely equipped to convert the steel plate of your choice into completely-fabricated assemblies or simple, single-operation parts or components. Job-shop facilities of all kinds are available to furnish welded, rolled, sheared, flame-cut, pressed, punched or machined products to exacting specifications. Claymont's fabricated structural weldments range from 120-ton fully-welded sections to such items as bearing assemblies, base and tie plates, wedges, gussets and straps.

Use Claymont's complete plate fabrications facilities as an extension of your own shop. Have difficult, time-consuming operations performed *before* the steel plate is delivered, and save shipping and handling on the part of the plate that you can't use.

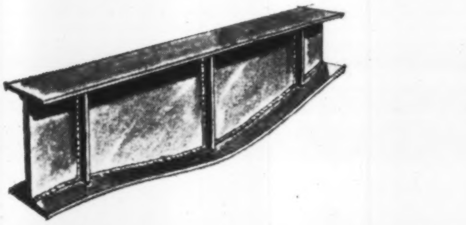
If you use any of the steel plate products listed above, or large diameter API Pipe, contact the nearest CF&I sales office.

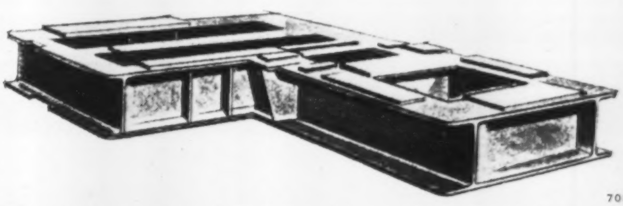
Claymont Steel Products

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

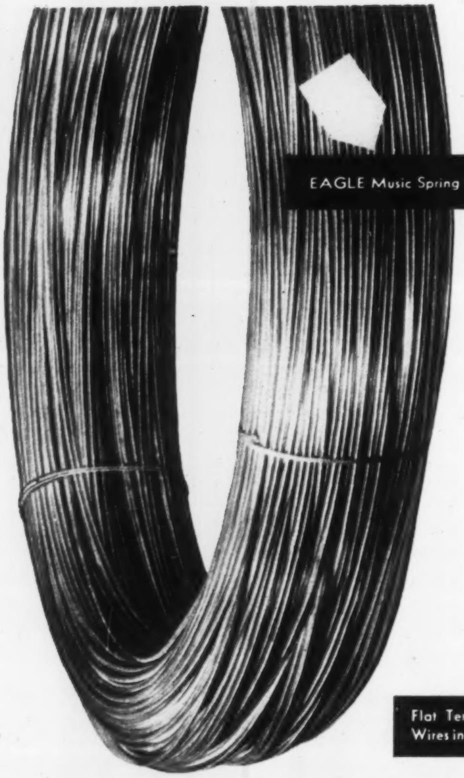
***In the West:* THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso
Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa • Oklahoma City • Phoenix
Portland (Ore.) • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita
***In the East:* WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CF&I OFFICE IN CANADA: Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg





7086

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish

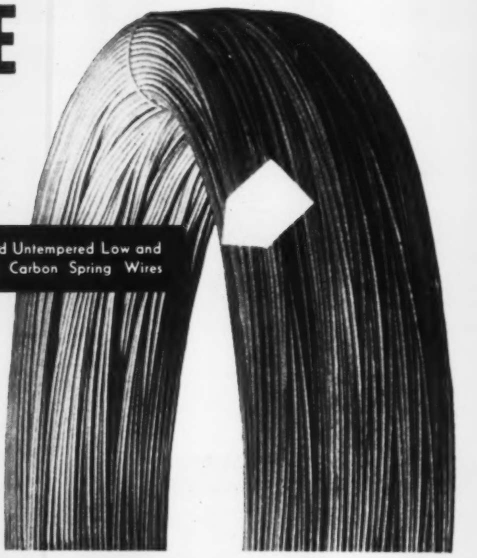


EAGLE Music Spring Wire

Flat Tempered and Untempered Wires in .50 to 1.25 Carbon Range

Here is the WASHBURN WIRE FAMILY

made to your specifications to insure the Quality of YOUR Product.



Round Untempered Low and High Carbon Spring Wires

110

WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY
CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Power-Up with new
Westinghouse Life-Line H
d-c motors

Cleaner, cooler operation . . . less maintenance . . . longer, trouble-free life

HERE'S WHY: Ordinary d-c motor ventilation systems draw air in at the commutator end, contaminate windings by drawing carbon dust from commutator brush wear *into* the machine. In the new Life-Line® "H," this air flow is reversed. Air and carbon dust are expelled at commutator end . . . assuring cleaner, cooler windings . . . longer motor life . . . less maintenance.

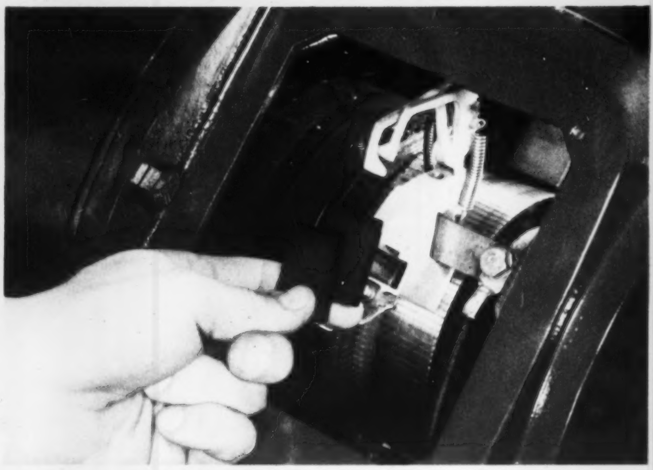
Plus . . . these other important advantages .... ➤

YOU CAN BE **SURE**...IF IT'S Westinghouse

These exclusive features of the new Westinghouse Life-Line H d-c motor guarantee top performance . . . longer, trouble-free life

TEN TIMES LONGER INSULATION LIFE . . . New silicone insulation in Westinghouse Life-Line* "H" d-c motors and generators stands up under temperatures which turn ordinary insulation to a cinder. High-temperature silicone insulation is used with the full complement of iron and copper required for low Class B temperature. Result: Life-Line "H" shrugs off emergency overloads and abnormal ambients to keep production rolling, maintenance down.

GREATER PROTECTION . . . most complete and advanced protection available in dripproof industrial d-c machines. Elimination of uncovered side openings . . . heavy, cast end brackets . . . effective seals throughout . . . all combine to provide outstanding resistance to liquids, vapors and dirt. This means longer life with greater reliability . . . minimum maintenance under all operating conditions.



FASTEST RESPONSE . . . 35 per cent increase in commutating ability . . . up to 55 per cent lower mechanical inertia . . . and up to 30 per cent reduction in electrical inertia mean that the new Westinghouse Life-Line "H" d-c motor provides the fastest acceleration, quickest reversing and closest speed regulation. This means more production, better product quality, minimum complexity of control.

SIMPLIFIED MAINTENANCE . . . With the new Life-Line "H," maintenance is not only substantially reduced but periodic inspections are also greatly simplified. For example: as shown above, Uniforce brushholder fingers lock out . . . brushes can be inspected or changed with one hand. And Uniforce tension remains constant throughout brush life . . . no need to adjust pressure as brushes wear.

For information about the ways you can profitably put the new Life-Line "H" motor to work, contact your nearby Westinghouse representative. Or, write Westinghouse Electric Corporation, P. O. Box 868, 3 Gateway Center, Pittsburgh 30, Pa.

J1-22122

YOU CAN BE SURE...IF IT'S Westinghouse

4 cubic yards
4-6 tons
dipper shovel
$162,000

When you're talking about a $162,000 dipper shovel, you've got to talk about the best rope for it

Talking about or working with, the same thing applies. Anything below Royal Blue's performance level is simply unrealistic. Like looking for a cut-price brain surgeon.

Even at $162,000, the cost of wire rope is important. That's why so-so ropes can cost you more in the long run, because so-so ropes are *short run*. Royal Blue, on the other hand, is built by America's oldest manufacturer of wire rope to last, to do the job without a whimper. Here's why.

Royal Blue is made from the toughest rope wire ever made—Type 1105—extra high-strength improved plow steel. This pedigree gives to the rope qualities that you can't find in any other rope: exceptional resistance to shock, abrasion, fatigue and impact. Add to these a flexibility that age cannot wither nor hustling fade and you've got a collection of characteristics that make Royal Blue the strongest rope you've ever used.

A $162,000 Dipper Shovel deserves the best and your Roebling Distributor has it . . . Royal Blue. For information, write to Roebling's Wire Rope Division, Trenton 2, N. J.

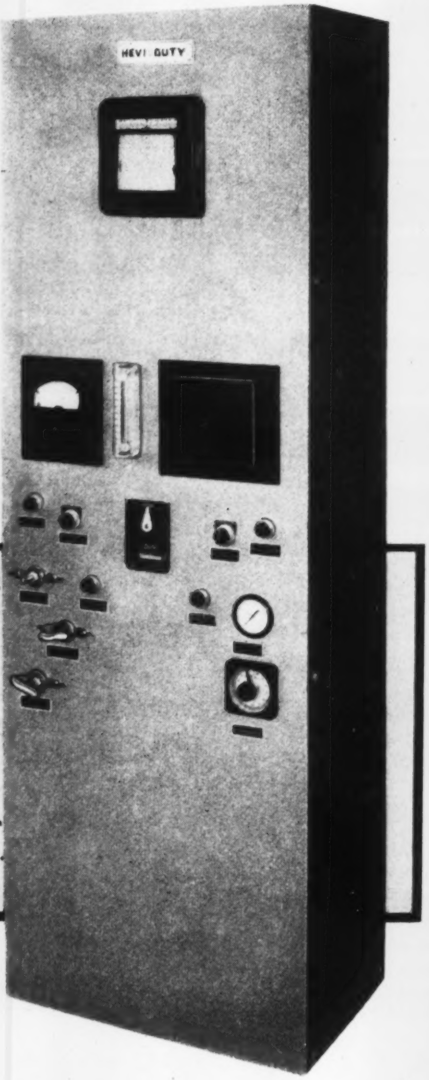
ROEBLING
ROYAL·1105·BLUE

ROEBLING

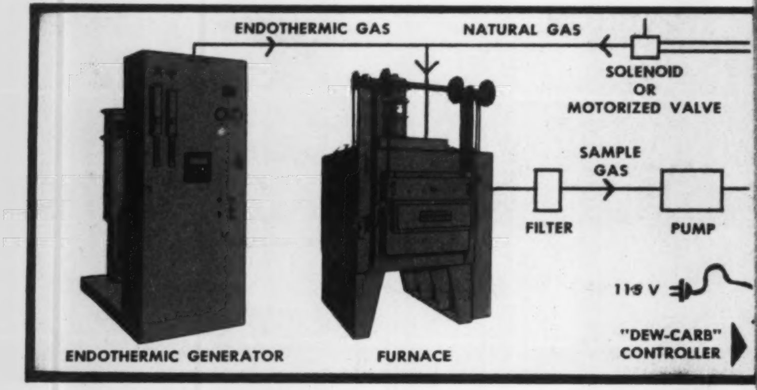
Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

NEW . . . instrument for controlling carbon without cooling . . . from

HEVI-DUTY



"Dew-Carb" Controller measures dew point...controls atmosphere carbon



Provides instantaneous response to sudden change of dew point of furnace atmosphere.

Assures precise measurement of moisture in furnace atmosphere — minus 5° to plus 60° F. dew point.

Does not require cooling of gas sample.

Hevi-Duty's new "Dew-Carb" Controller operates on a wet-dry bulb principle, measuring *precisely* the dew point in controlled atmosphere for furnace processing — bright hardening, carbon restoration, carburizing . . . controlling of surface carbon concentration and depth characteristics. No chemicals, such as lithium chloride, are required in this system.

Hevi-Duty's "Dew-Carb" Controller can be utilized in three types of furnace applications:

1. To *monitor* endothermic generator gas, or the gas within the furnace.

2. To *measure* dew point and instantaneously regulate the carbon in endothermic atmosphere. Instrument can be adapted to either generator or furnace . . . can be used with one generator supplying endothermic gas to several furnaces . . . gas for each furnace can be separately measured.

3. For batch type, enclosed quench furnace applications, such as the Hevi-Duty "Clean-Line" furnace, an automatic system restores atmosphere equilibrium immediately after loading of the furnace, and restarts automatically when load reaches proper temperature.

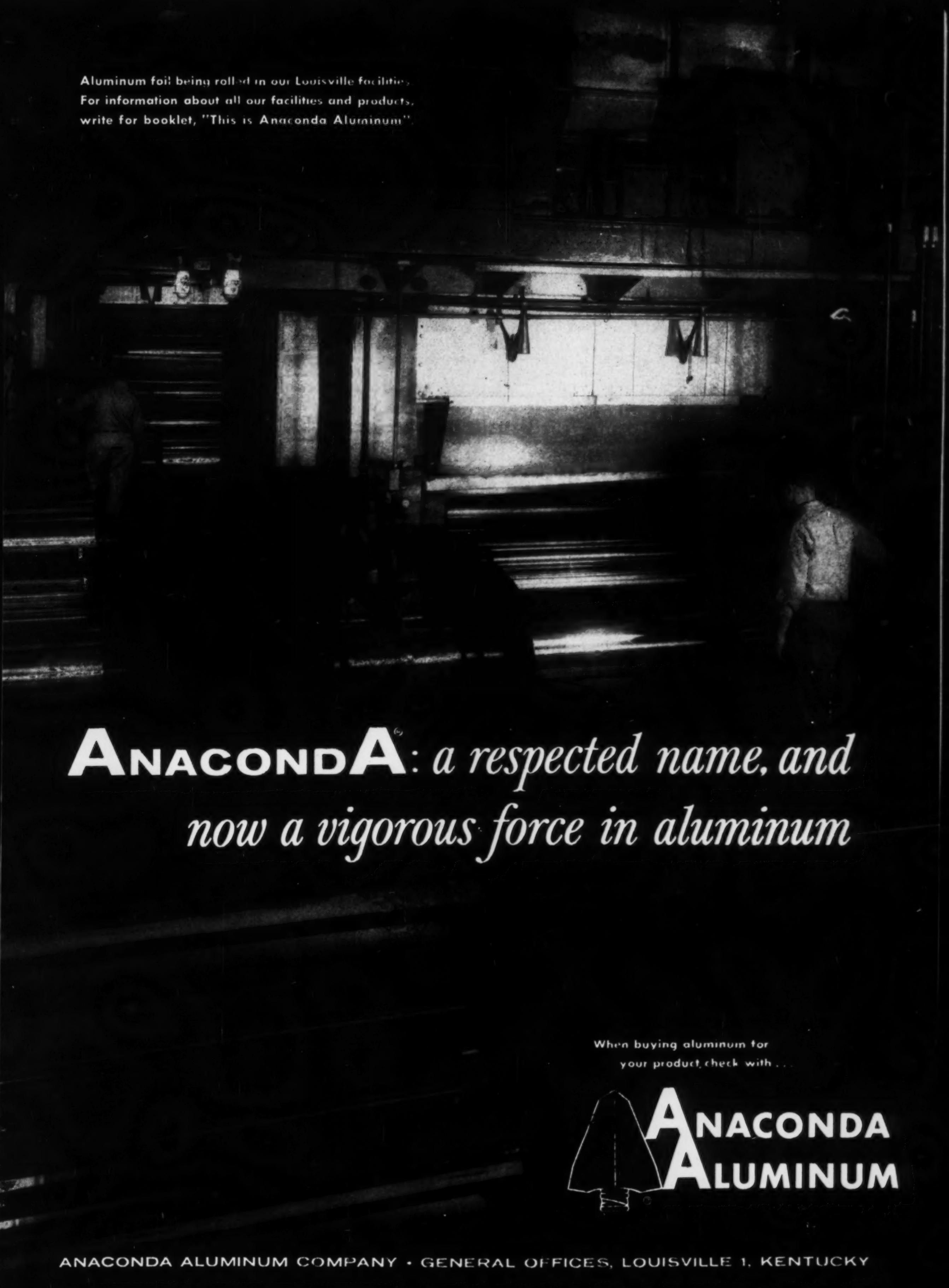
For more information on the new "Dew-Carb" Controller, write, or call Hevi-Duty today.

HEVI-DUTY

A DIVISION OF BASIC PRODUCTS CORPORATION

HEVI-DUTY ELECTRIC COMPANY, MILWAUKEE 1, WISCONSIN

Industrial Furnaces and Ovens, Electric and Fuel • Laboratory Furnaces • Dry Type Transformers • Constant Current Regulators



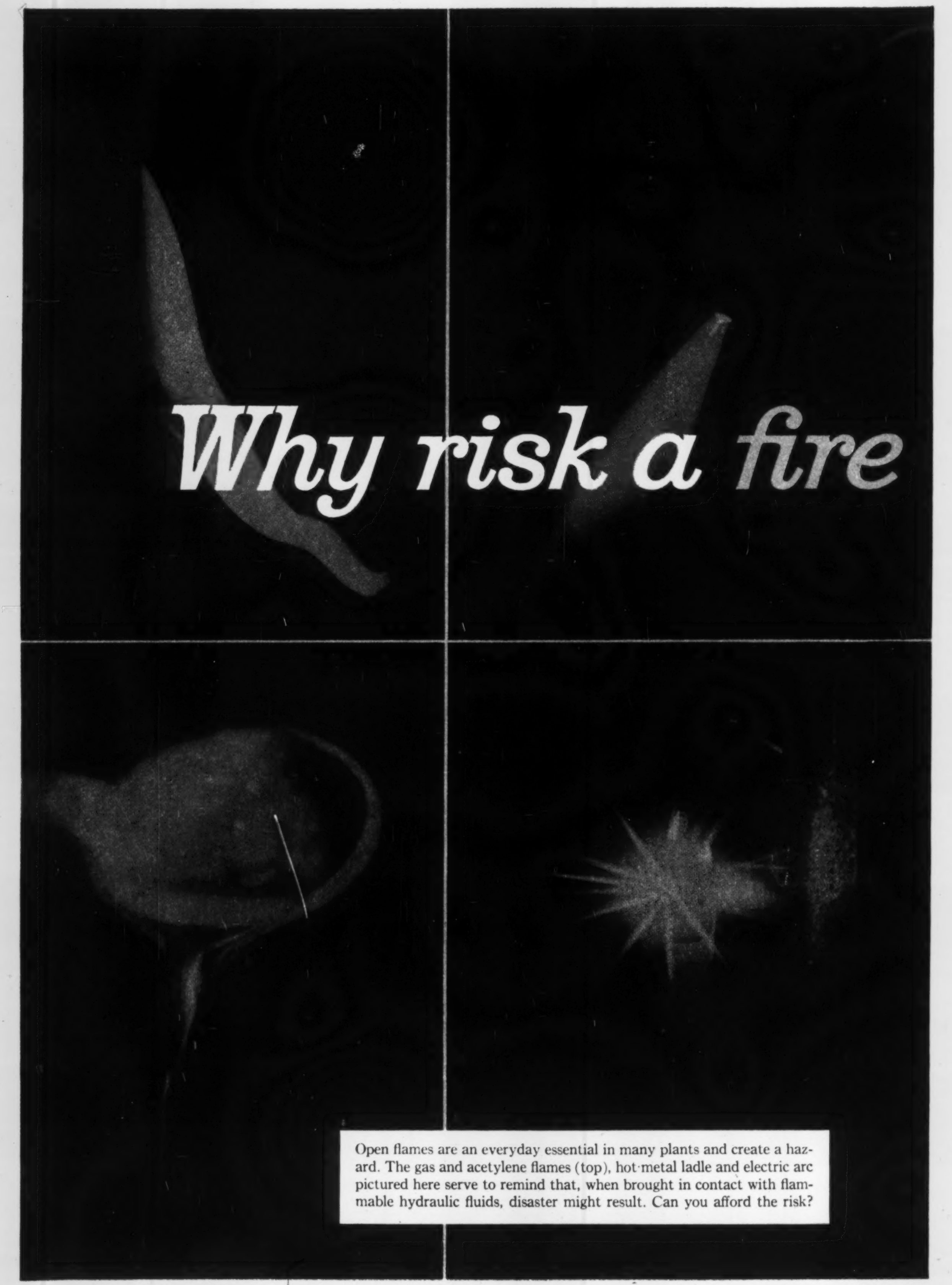
Aluminum foil being rolled in our Louisville facilities.
For information about all our facilities and products,
write for booklet, "This is Anaconda Aluminum".

ANACONDA®: *a respected name, and now a vigorous force in aluminum*

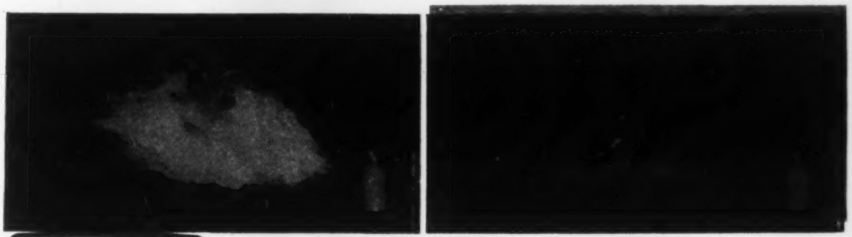
When buying aluminum for
your product, check with . . .

ANACONDA ALUMINUM

ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE 1, KENTUCKY



Open flames are an everyday essential in many plants and create a hazard. The gas and acetylene flames (top), hot-metal ladle and electric arc pictured here serve to remind that, when brought in contact with flammable hydraulic fluids, disaster might result. Can you afford the risk?



Mobil Research

At left: Test developed by Mobil Research shows how atomized petroleum hydraulic fluid is easily ignited by small gas flame; at right, how when replaced by Mobil Nyvac, no ignition occurs.

disaster? Insure the safety of your plant and personnel with a Mobil fire-resistant hydraulic fluid!

Mobil's newly developed family of fire-resistant fluids for hydraulic systems meets every type of industrial requirement . . . provides adequate protection at lowest possible cost.

When you change to Mobil fire-resistant fluids, you get the assistance of trained Mobil engineers who analyze your plant systems, tell you which fluid should be used. Mobil engineers also help you install the fluid properly and set up an effective maintenance program; provide practical field-tested procedures for reducing leakage and increasing efficiency.

These Mobil fluids offer a practical means of safeguarding personnel, property, production schedules . . . increasing your sales profits. Call in your nearest Mobil representative today. He'll be glad to give you full details.

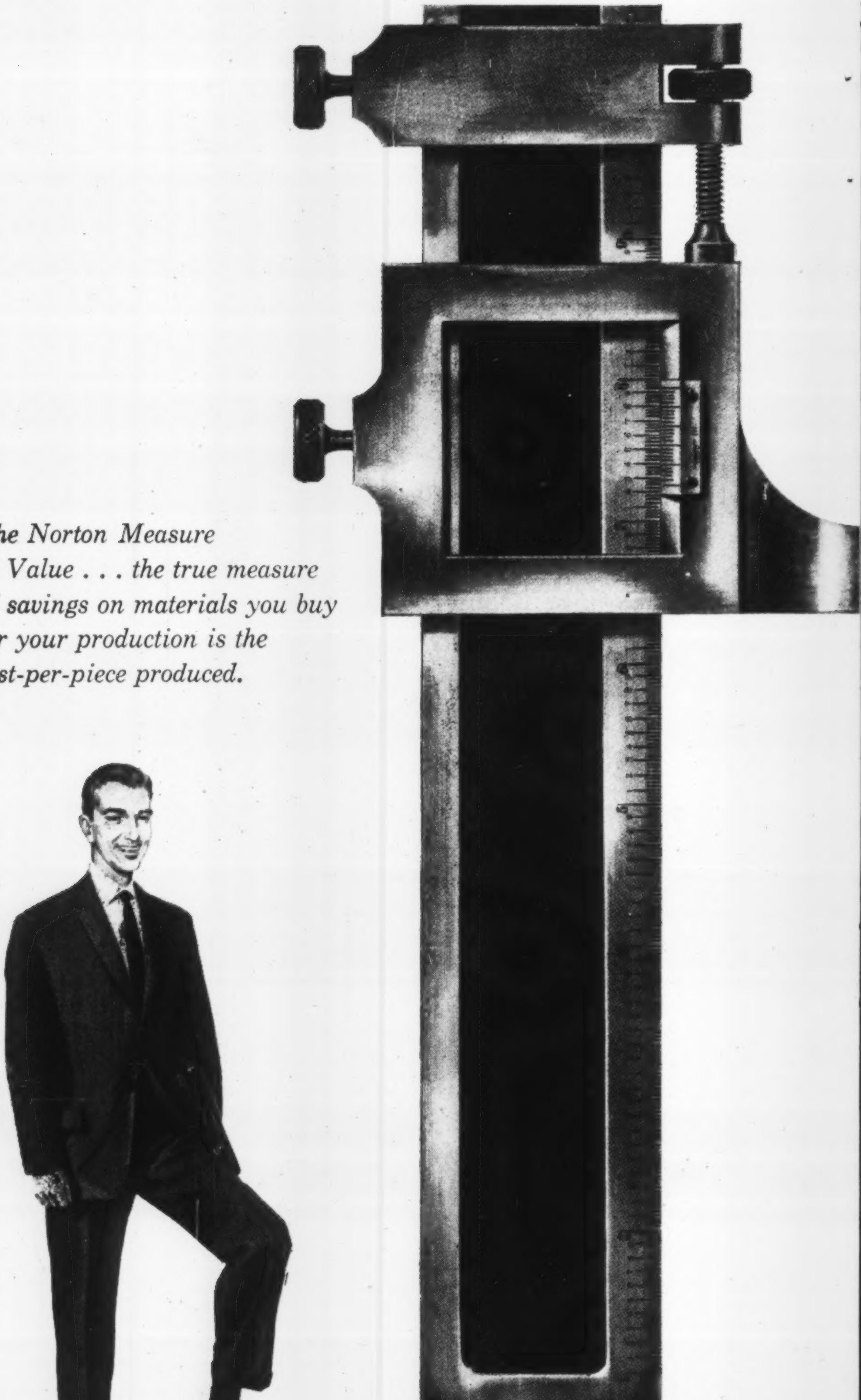
Mobil Pyrogard—a superior synthetic product of the phosphate-ester type family. Very successful in hydraulic systems and multi-stage compressors. Outstanding anti-wear quality; excellent anti-rust and anti-foam properties.

Mobil Nyvac—combines the fire-quenching qualities of water with glycol and special additives for lubricity and viscosity. Rust inhibitors protect machine parts both above and below fluid levels. Unusual resistance to deposit formation and wear. Impressive viscosity stability, anti-corrosion, and anti-foam properties. Excellent performance at low temperatures.

Mobil Solvac—low-cost, oil-water emulsion fluid particularly suited to systems with plunger and centrifugal-type pumps. For systems serving large presses, forging machines, rubber presses and steel mill back-up roll balances. Resists bacterial growth, has excellent rust-inhibiting properties.

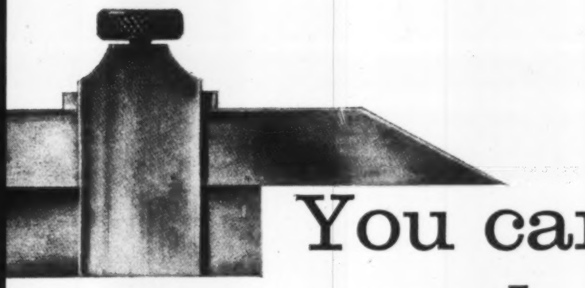
PROVED PETROLEUM PRODUCTS
AVAILABLE WITH A
MOBIL PROGRAM OF CORRECT LUBRICATION

Mobil



The Norton Measure of Value . . . the true measure of savings on materials you buy for your production is the cost-per-piece produced.

Call your Norton Man — he has the **experience,** the products, **and knows** how to save you money where it counts. There's a **Norton expert** in the fields of — **abrasives** . . . grinding machines . . . **refractories.**



You can produce greater savings than you can buy

You can't recognize a value by its price alone. This is true of all types of grinding wheels and has special significance in diamond wheels in view of their high initial cost.

The price tag on a diamond grinding wheel may appear to be a good "buy," but the real consideration should be what will you get for your money?

Less expensive diamond grinding wheels than Norton wheels may save you money on immediate cost. But if the lower cost wheels do not perform their jobs efficiently or cause production delays because of poor quality or wheel misapplication — the price you paid is too much.

The only accurate measure of the value of any grinding wheel is how much it produces for you per dollar cost — not merely how much you paid for it. Here is why Norton diamond grinding wheels are worth more to you —

Norton Company introduced all three diamond wheel bond types, does all its own sizing and checking of diamonds — duplicating wheel specification with constant accuracy. Norton certifies the carat content, assuring full value for your money. Whether the diamonds you use in carbide grinding are mined or man-made, Norton gives you the most advanced research engineering and manufacturing facilities in the entire abrasive field. And you get this great scope of detailed knowledge on a personal basis — your Norton Man.

Your Norton Man starts his career by spending a minimum of one year in a carefully planned training course in the Norton plant and a comparable period of training in the field. The Norton Man has an average of 15 years' abrasive experience in addition to the specialized training. He is the most knowledgeable man in abrasives that you can consult. Make him your consulting abrasive engineer.

Ask him to make an Abrasive Requirement Study for you. This study lists the correct specifications for each abrasive job in your plant to assure you lowest cost-per-piece produced. He is also available for complete field testing on specific problems. For example —

Your Norton Man can increase production by pointing out ways for more effective wheel usage. He has the widest selection of grinding wheels in the industry from which to select the best wheel for new product grinding operations and for improving your current grinding jobs — both at the lowest cost. And with Norton grinding wheels you can be sure of precise duplication order after order.

Norton offers true abrasive economy. Economy that pays off in lower cost-per-piece produced. Call your Norton Man. NORTON COMPANY, General Offices, Worcester 6, Massachusetts. Plants and distributors around the world.

W-1917

NORTON

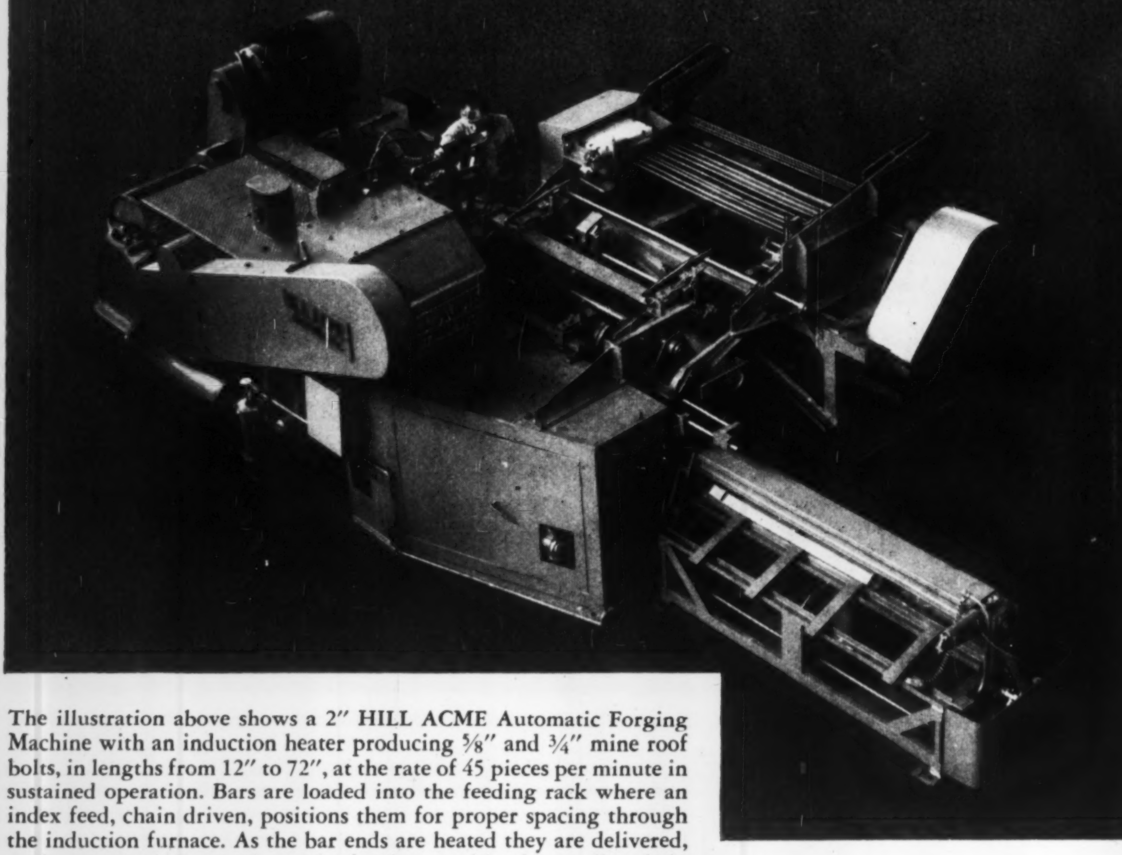
ABRASIVES

Making better products . . .
to make your products better

Fully Automatic

FORGING MACHINE

DELIVERS 45 PIECES PER MINUTE!



The illustration above shows a 2″ HILL ACME Automatic Forging Machine with an induction heater producing 5/8″ and 3/4″ mine roof bolts, in lengths from 12″ to 72″, at the rate of 45 pieces per minute in sustained operation. Bars are loaded into the feeding rack where an index feed, chain driven, positions them for proper spacing through the induction furnace. As the bar ends are heated they are delivered, at the proper timing cycle, to the forging machine by a roller chain feed where they are gauged for length, picked up by fingers and passed progressively through the dies. Finished forgings are discharged from the back of the machine by means of a separately driven conveyor, arranged for both right and left hand discharge.

The design of this new HILL ACME AUTOMATIC forging unit does not limit the number of passes or the length of stock to be used in forging a variety of parts. Pieces longer than 36″ are supported by a walking beam through the various passes.

HILL ACME AUTOMATIC forging machines are built in 1¼″ to 5″ capacities all of which can be automated. Your inquiry concerning high speed automatic forging equipment will receive prompt attention.

The HILL ACME Company

1207 W. 65th STREET • CLEVELAND 2, OHIO

HILL ACME TOOLS FOR INDUSTRY

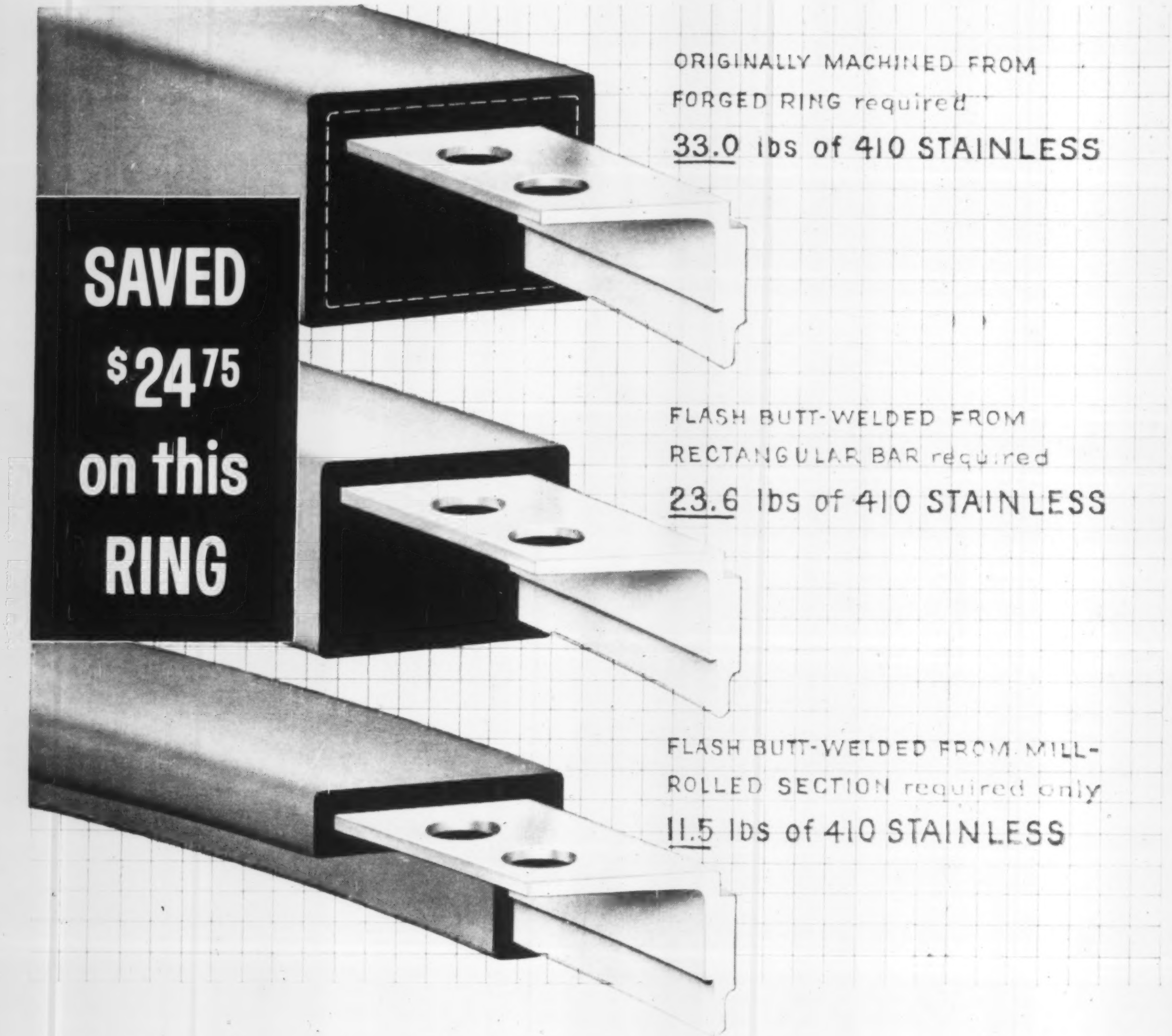
Manufacturers of: "ACME" FORGING-TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • ROTARY SHEARS • BAR-BILLET SHEARS • "HILL" GRINDING AND POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • "CLEVELAND" KNIVES • SHEAR BLADES • MATERIAL HANDLING EQUIPMENT

Crucible stainless highlights the quality in your product

This is because Crucible precision-rolls stainless to produce finishes of incomparable lustre. Not only that, Crucible methodically checks each heat to ensure uniform physical properties and accurately controls gauge with electronic measuring devices. For stainless in all gauges down to .010″ and in all strip widths, call or write: Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

CRUCIBLE STEEL COMPANY OF AMERICA

CANADIAN DISTRIBUTOR — RAILWAY AND POWER ENGINEERING CORP., LTD.


SAVED $24.75 on this RING
ORIGINALLY MACHINED FROM FORGED RING required 33.0 lbs of 410 STAINLESS
FLASH BUTT-WELDED FROM RECTANGULAR BAR required 23.6 lbs of 410 STAINLESS
FLASH BUTT-WELDED FROM MILL-ROLLED SECTION required only 11.5 lbs of 410 STAINLESS

Switch to flash butt-welded compressor ring saves 21.5 lbs. of material—cuts machining time

By selecting a special-mill-rolled section close to finished dimensions, only 1/3 as much material was required to produce this ring. (Similar material savings could be realized on extruded sections.)

In addition, 45 minutes of expensive machining time were eliminated.

Flash butt-welded rings like this have been used in critical applications such as jet aircraft engines and present day missiles. They offer cost saving advantages in many fields, particularly where stainless or other heat or corrosion-resistant materials are employed.

Amweld's experience in forming, welding and machining circular parts is available to you. Write or call today. Or send blueprints and specifications—we will be glad to study your problem.

LEARN HOW FLASH BUTT-WELDED RINGS CAN REDUCE PRODUCTION COSTS.

THE AMERICAN WELDING & MFG. CO. • 110 DIETZ ROAD • WARREN, OHIO

AMERICAN WELDING

STEEL

Metalworking Outlook

December 14, 1959

The Public Holds Four Aces

The public has the strongest hand in the steel labor contest—and the stakes are mounting. Among the cards in the public's hand: The strength of opinion, the power of elected representatives in government. And several of those representatives have suggested that Congress will swing into action if the USW walks out again in January (Page 57).

Cleveland Economist Sees "Banner Year" Ahead

Inventory accumulation at a $9 billion per annum rate . . . Capital spending rising 15 per cent to $39 billion . . . Total government outlays up $3 billion to $4 billion . . . Exports up about $1 billion . . . Personal income rising to $402 billion and net disposable income reaching $352 billion or above . . . Consumer spending for durable goods up $5 billion to between $48 billion and $49 billion . . . Physical volume of construction off about 2 per cent, but dollar volume steady . . . 1.1 million housing starts . . . Wholesale prices rising 2 per cent . . . Continued high interest rates and restrictions on the supply of money . . . A moderate rate of growth in the second half. Those predictions for 1960 were made last Tuesday by Russell H. Metzner, vice president and economist, Central National Bank, Cleveland.

14,500 Metalworking Plants Will Expand in '60

Look for 14,500 metalworking plants to boost their production capacity in 1960. That's almost half the plants in the industry. Their outlays will lift the production capacity of metalworking by 4.5 per cent. The electrical machinery and equipment industry will register the largest increase—8.5 per cent. By size of plant, the most optimistic plans are being made by those employing less than 100; they'll hike capacity 5.1 per cent (Page 59).

How Key Industries Fared in October

October heat treating billings registered a 27.4 per cent increase over those in the like 1958 month, reports Metal Treating Institute . . . Net new orders for industrial heating equipment totaled $12,967,000 in October—a 133 per cent gain over the September volume, notes Industrial Heating Equipment Association . . . October radio output dropped 9 per cent from the September level, but output for the first ten months of this year was 43 per cent ahead of that in the like '58 period, says Electronic Industries Association . . . EIA adds that TV production in October declined 12 per cent from the September level, but output for the first ten months of '59 was 28 per cent above that of the like '58 period . . . Gas Appliance Manufacturers Association says shipments of central heating equipment during the first ten months of '59 were 24 per cent higher than those of the like '58 period . . . American Supply & Machinery Manufacturers' Association reports its members' new orders in October fell 1.4 per cent below the September level.

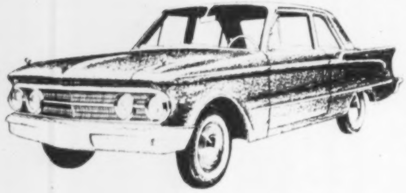
How to Beat a Price Increase

Suppose you learned today that the price of steel strip was going to be raised 5 per cent next week. You use steel strip in your product. What would you do? Your best move would probably be to rush in an order for the product at the old price. But how much would you order? There's a scientific—and fairly simple—way to find out what the optimum quantity would be (Page 61). It was explained at an American Management Institute meeting last week by Bert L. Hansen (picture), AMI director.

Three-Industry Outlook for '60

Look for 1960 shipments of cast iron soil pipe and fittings to total 825,000 tons for the third best year in history, predicts the Business & Defense Services Administration . . . BDSA expects 1960 new orders for power boilers to rise about 50 per cent above the '59 level, while shipments will decline . . . "Manufacturers' unit sales of major home appliances in 1960 will jump nearly 10 per cent ahead of the '59 mark," contends Judson Sayre, president, Norge Div., Borg-Warner Corp.

The Comet Is Coming—Ford's, Not Halley's

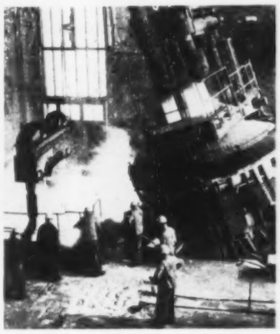


Look for Ford to introduce its new compact car, the Comet (artist's sketch at left), in late February, not April or May, as earlier planned. The Falcon engine, with a special performance package, will power the Comet (Page 75).

CF&I May Build Steel Plant

After the steel labor settlement, Colorado Fuel & Iron Corp. will revive consideration of its proposed steel plant at Claymont, Del., A. F. Franz, president, told STEEL last week. The plant would include a blast furnace, oxygen converter, and a four high plate mill. Meanwhile, construction is continuing on an oxygen converter plant at Pueblo, Colo., which will boost ingot capacity 600,000 tons annually. Also being added there are new wire drawing machines and patenting furnaces. Completion is scheduled for early 1961.

Western Europe Rides a Boom

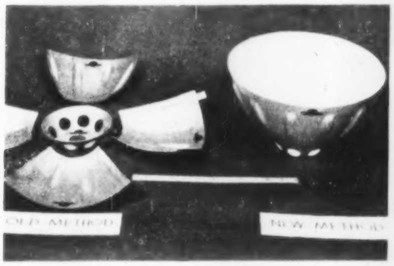


Since 1953, industrial production in Western Europe has climbed 39 per cent—nearly three times the U. S. rate. Steel production in the European Coal & Steel Community nations this year will be 4.5 per cent greater than the previous high recorded in 1957. But some observers see a gigantic trade war in the offing. On one side: The Common Market. On the other: The newly formed European Free Trade Association—another huge preferential tariff zone set up by seven nations (Page 64).

How Gas Appliance Makers See '60 Sales

A Gas Appliance Manufacturers Association survey of members shows these forecasts for 1960 unit sales of gas appliances compared with 1959's: Domestic ranges—up 2.9 per cent; automatic water heaters—down 0.1 per cent; central heating equipment—down 0.1 per cent; floor furnaces—down 13.4 per cent; direct heating equipment—up 1.2 per cent; incinerators—up 8.4 per cent; unit heaters—up 3.1 per cent; duct furnaces—up 5.8 per cent; vented recessed wall heaters—down 1.5 per cent; commercial ranges—up 1.5 per cent.

Can You Cash in on Explosive Forming?



Many metalworkers are getting set to do that. At Ryan Aeronautical Co., San Diego, Calif., explosive forming is already on a paying basis (Page 98). On one part (picture) an explosive formed cone replaces a five piece assembly. Part costs plummeted 90 per cent.

The New Materials Management Concept

In the wake of widespread industry acceptance of the new marketing concept, look for many firms to adopt a new concept of materials management. It involves a staff function to control the acquisition, use and flow of materials through co-ordination of sales, production, manpower, materials, and supply information, says Bert L. Hansen, director, American Management Institute, Cleveland. This staff department would integrate purchasing, production control, inventory control (raw materials, in-process, and finished goods), shipping, receiving, and storage. The department would also control the cost of materials and products while production management controls unit output. General Electric Co., Radio Corp. of America, and Bendix Aviation Corp. have already adopted the concept, says Mr. Hansen.

How to Spot Weld Defects

Weld defects, one of the industry's biggest bugaboos, again come under the STEEL spotlight. Helmut Thielsch, metallurgical engineer, Grinnell Co., Providence, R. I., tells you how to spot some common defects and how to protect yourself (Page 94).

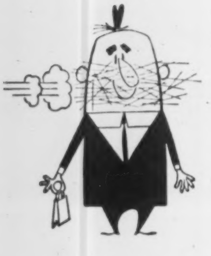
The Office of the Future

You'll dictate letters directly onto stationery via a magic machine that spells correctly and knows its grammar—and the color of the type may suggest the tone of the context . . . a desk model duplicating machine won't need ink or chemicals . . . Files will be display screens mounted on desks or walls. They'll be searched electronically, and you will dial for the information you need—which will then be flashed onto the display area . . . You'll be able to get up-to-the-minute data on sales, production, costs, inventories, and the like from a central "knowledge bank." That exciting glimpse into the future is provided by Walter Emmerling, international president, National Office Management Association.

Cuba, Three U. S. Firms Reveal Interest in Nicaro Facility

At least three American companies have informed the General Services Administration that they are interested in the government's nickel plant at Nicaro, Cuba. The Cuban government also has expressed an interest in acquiring the facility. Proposals submitted thus far will be used only as a "basis for negotiations" and "considerable time may be required to determine whether a sale acceptable to the U. S. can be concluded," says GSA.

Straws in the Wind



Look for consumption of aluminum diecastings to exceed 500 million lb next year, predicts Alfred A. Bauer, assistant general manager, Doehler-Jarvis Div., National Lead Co. . . . Consumers boosted their instalment debt in October by a seasonally adjusted $512 million—the biggest hike this year . . . American Motors Corp.'s Kelvinator Div. sold 35 per cent more major appliances this year than last . . . The American Coke & Coal Chemicals Institute will join the Gray Iron Founders' Society in promoting increased use of iron castings . . . Lincoln Electric Co.'s 1371 employees were paid $6,488,167 in annual incentive pay on Dec. 4 . . . A 16 week strike at American Brake Shoe Co., Calera, Ala., ended with the USW getting a 6 per cent wage hike in a two year contract . . . Construction costs dropped in December for the third straight month, reports *Engineering News-Record* . . . Employment will rise in December, predicts the Labor Department . . . Great Lakes Steel Corp. fired three USW officials in a dispute stemming from company meetings to correct a slowdown in some operations.

New user reports say once again... rely on Ryerson for increased values

Here are new case histories that typify how thousands of steel and aluminum users who rely on Ryerson get *increased values* for their purchasing dollars. Individual points of difference between Ryerson and other sources may not in every case seem overwhelming—but in total they add up to an important difference in dependability, experience and capacity to serve.

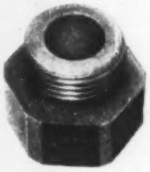
Production up 30%. In the manufacture of this coupling, a large job shop recently switched from MT 1015 tubing to Ledloy® 170 tubing from Ryerson. Machining speed was stepped up to 170 sfm, and production increased 30%.

Emergency needs met. A breakdown was cutting output of a big paint producer, and the steel needed to repair the break was not available in the area. However, the required analyses and size were on hand at the nearest Ryerson plant 200 miles away—and within an hour Ryerson delivered 100 feet of this bar stock to the local airport. Three and a half hours after calling Ryerson in another state, the customer had his steel.

Aluminum key to low-cost production. Aluminum from Ryerson replaced chrome-plated brass on this hub for a disposable hypo needle—saving two-thirds of basic material cost plus elimination of expensive chrome plating. Machinability was equal to that of brass.

Switch to stainless doubles production of missile part. When this part was made of alloy steel, tolerances for threads and finish were not consistently held. And there were 25% rejects after plating. The solution came when specs were changed to free-machining Type 416 stainless from Ryerson. Plating was eliminated . . . production was doubled . . . thread tolerances were held . . . and the required finish was easily produced in milling operation.

Better product appearance and a worthwhile saving in material cost resulted when a Ryerson man recommended that a producer of portable coolers switch from one aluminum alloy (3003-H14) to another (5005-H14). Slightly higher structural strength was a bonus value. Unusually broad aluminum stocks and technical resources often enable Ryerson to serve in this way.



PVC cuts costs 50%. A screw machine shop recently replaced nylon with Ryertex®-Omicron PVC in the manufacture of a nipple adapter and coupling nut, and cut costs 50%. PVC machined better—to closer tolerances with improved finish . . . ran faster without "gumming." Note the perfect cutting of threads and barbs. Threads fit perfectly.

These examples illustrate some of the many advantages that make Ryerson service truly unique. A call to your Ryerson representative may solve similar problems for you.

I·V·B·M

Increased Value in Buying Metals

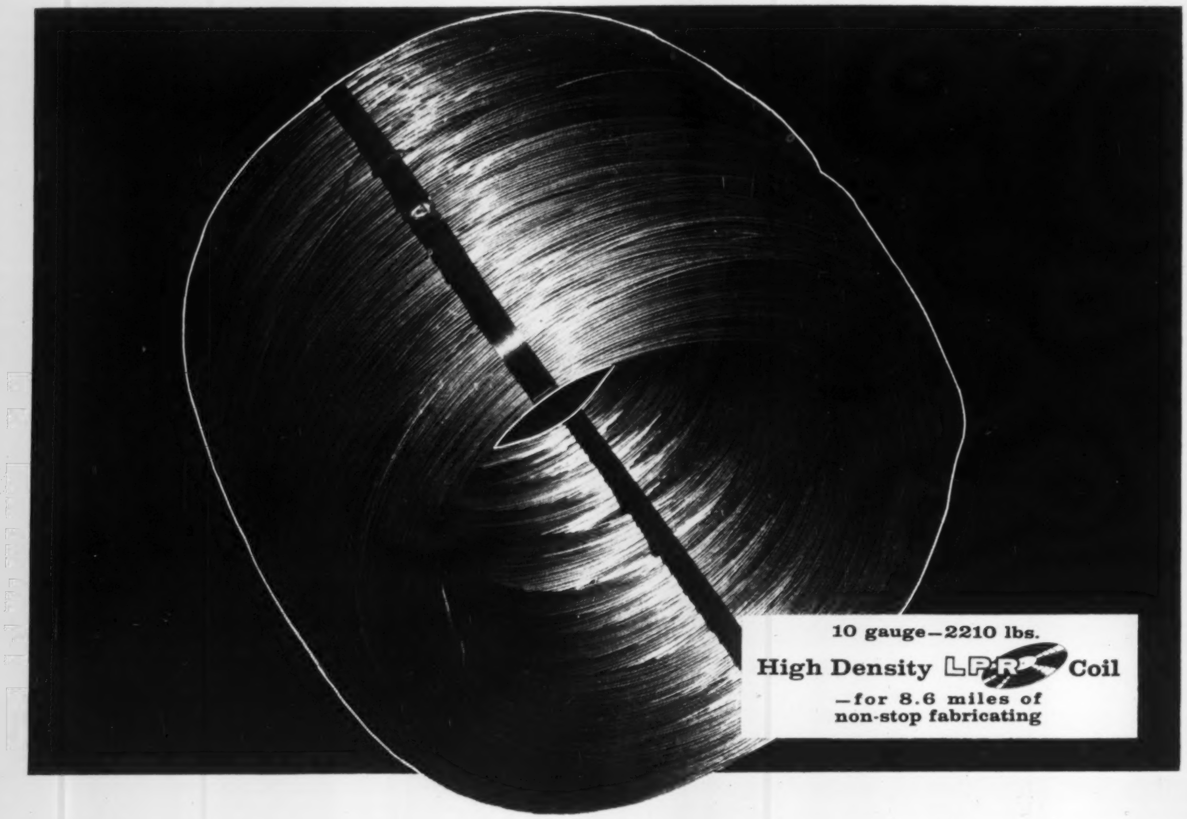
Ask about this Ryerson Plan for 1959

RYERSON STEEL®

Joseph T. Ryerson & Son, Inc., Member of the INLAND Steel Family

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST



10 gauge—2210 lbs.
High Density LPR Coil
—for 8.6 miles of non-stop fabricating

How DSC-Portsmouth Long Production Run Coils Help You Reduce Your Brite Wire Fabricating Costs

LPR

CONTINUOUS LENGTH BRIGHT WIRE COILS

LOW AND MEDIUM CARBON

.072" .500" inc. (to about 4200 lbs.)
.023" .071" inc. (to about 1000 lbs.)

HIGH CARBON

.072" .250" inc. (up to about 4200 lbs.)
.023" .071" inc. (up to about 1000 lbs.)

COIL DIMENSIONS
ON REQUEST

LPR's (compared with 300 or 400 lb. traditional mill-weight bundles) cut down-time frequency for coil changes and setup adjustments from 50% to 92.8% and slash coil-end scrap loss proportionately.

Users report man-hour cost savings of 20% and more resulting from increased output per machine-hour and faster job-completions.

LPR's cost no more than the small coils. They widen your profit margins, strengthen your competitive position.

Possessing greater density and self-support, LPR's conserve storage space, cut unloading time from 15% to 50%, improve your all-around efficiency of inventory management and materials handling. Also eliminate the bother and expense of handling vendors' returnable carriers.

We'll document any of the foregoing statements for bona fide Brite Wire users.

For helpful hints on Brite Wire fabricating or reprints of "*The Drawing and Handling of Long Production Run Wire Coils*" by Uno V. Johnson, please write Detroit Steel Corporation, Box 4308, Detroit 9, Michigan

Performance Proved DSC®
DETROIT STEEL
Flat Rolled and Wire Products

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Happy Holidays and a
Big New Year for All

December 14, 1959

People Want to Know!

In walking through a medium size metalworking plant with the company's president, we were struck by the frequency with which he and the shop people exchanged pleasant greetings.

At one point, he was hailed by an operator who had just finished machining a part for a new piece of equipment.

The two discussed the job man-to-man in an atmosphere of mutual interest, understanding, and respect—not as the boss upstairs talking down to an hourly worker in the shop.

Here, we felt, was a demonstration of the type of communication so badly needed in industry today—not only between management and labor but between all levels of management.

We explored further to determine whether the incident was pure happenstance. It was not.

The company makes capital equipment as part of an exceedingly competitive industry.

It is in a large city where the going wage rate is 22 cents an hour higher than that of a competitor in another city, 17 cents an hour higher than that of a second competitor.

Currently, the company is negotiating a new wage contract with a national union run by tough local leaders.

But, long ago, company management decided to lay all the facts on the line about its activities, including its sales (or lack of them), how income is spent, production plans, changes in policy, and what it intends to do in the future.

It assiduously tries to avoid grapevine reports and rumors by anticipating and explaining the facts involved.

Of course, the president cannot make all the contacts with the people in his organization. But he does make certain that supervisory personnel are informed, so they can help pass the word.

As top man, he has established a warm and friendly climate in which good human relations are encouraged.

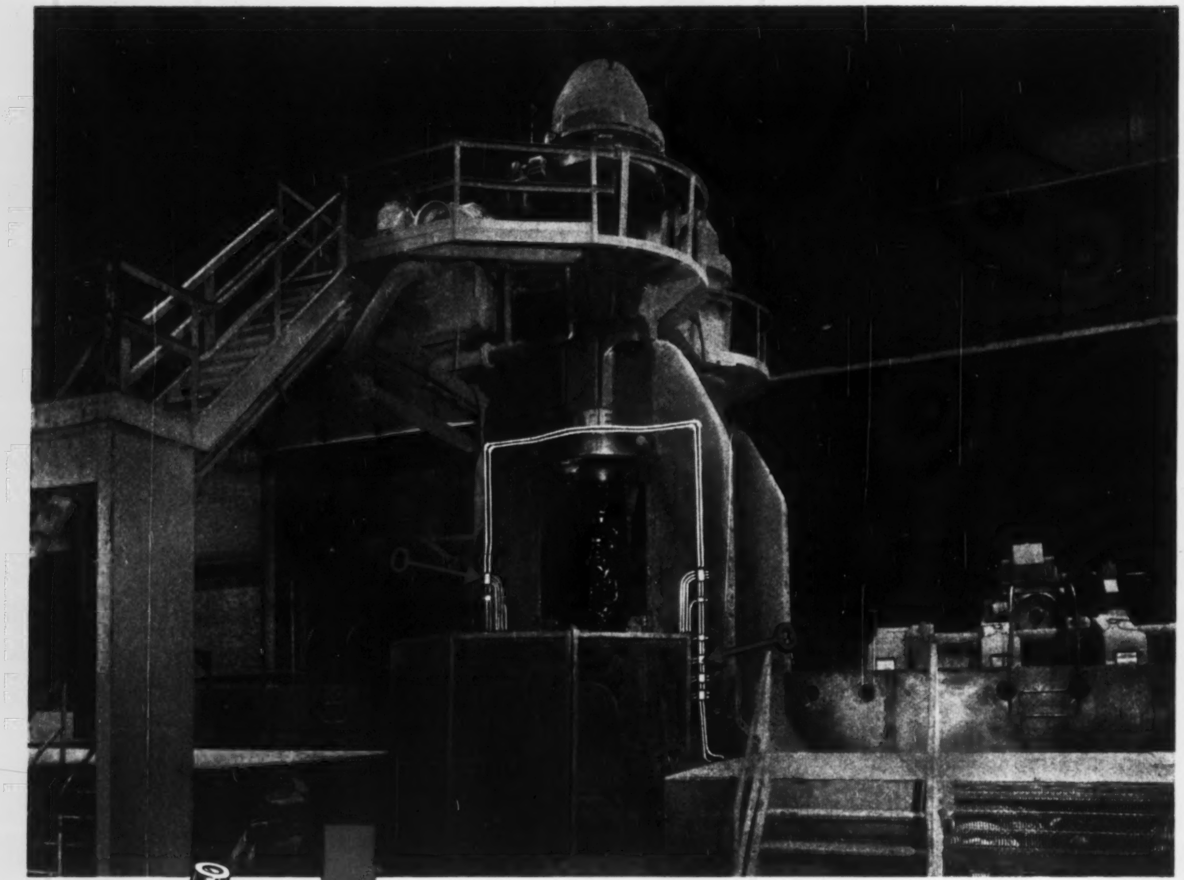
Establishing such a climate is no easy chore.

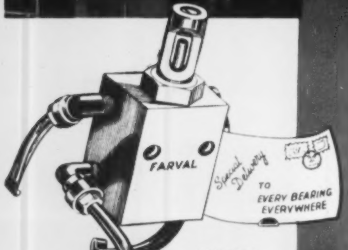
But once it is established, the payoff in high employee morale and greater productivity will be many times the investment in time and effort.

In essence, it simply means telling people what they want to know!

Irwin H. Such

EDITOR-IN-CHIEF





FARVAL
—Studies in
Centralized
Lubrication
No. 240

Farval automatic systems lubricate Geneva Works 45-inch slabbing mill

The fast and synchronized action of this 45-inch slabbing mill at the Geneva Works of Columbia-Geneva Steel Division, U. S. Steel Corporation depends to a large extent on properly lubricated bearings. Sixteen Farval systems automatically lubricate more than 1,000 bearings throughout the slabbing mill. Other Farval systems serve more than 6,000 bearings at the Geneva Works. Lubricant in the correct amount is delivered at regular intervals under the most rugged conditions and combinations of heat, shock and vibration.

Case histories prove Farval lubricating systems more than pay for themselves in savings of bearing loss, excessive lubricant and improved housekeeping practices.

Now is the time to find what Farval can do for you —

There is a Farval System to meet almost *every* lubrication requirement. Write for Bulletin 26-S.

The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

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KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and pump stations —you know steel mill equipment is being properly lubricated.

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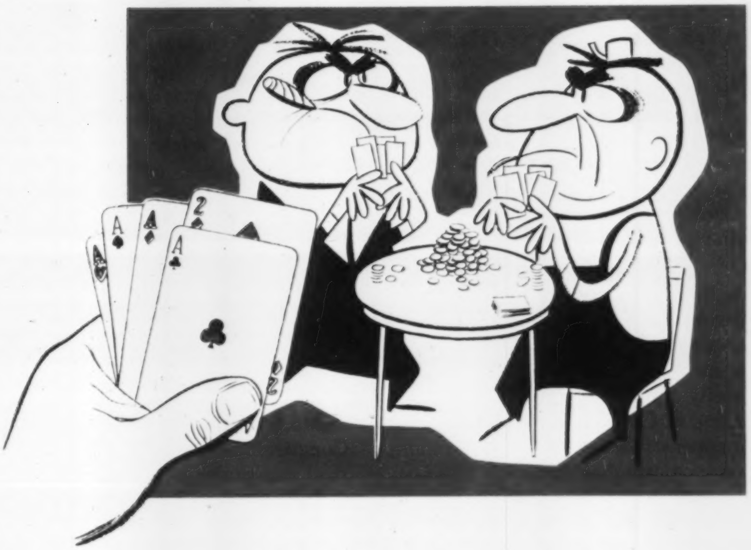
CENTRALIZED
SYSTEMS OF
LUBRICATION

STEEL CASE

Will the Public Take a Hand?



THE IMPASSE IN STEEL can only be broken by the public, as the third player in the high stakes poker game.

"The present question is not how long steel and the union can hold out, but how long the patience of the American people will endure," says Rep. Graham A. Barden (D., N. C.), chairman of the House Committee on Education & Labor.

- **Stalemate** — The United Steelworkers' 171 member Wage Policy Committee has already voted to renew the steel strike if no agreement is reached by Jan. 26 when the 80 day Taft-Hartley injunction ends. The companies' package of Nov. 15, called the "last offer" by U. S. Steel Corp. in a pamphlet to explain it to employees, is described this way by the USW: "Just a rehash of previous offers—and in some respects even worse than the previous proposals."

Much of the union's latest edition of its newspaper *Steel Labor* is devoted to an attack on the Nov. 15 proposition (STEEL, Nov. 30, p. 59). The reason for the virulence of the criticism: The industry apparently will stand pat with the Nov. 15 hand. That offer will be the one on which employees may vote by secret ballot supervised by the National Labor Relations Board. (Voting will be between Jan. 6 and 21, 1960.) The implication is clear: Neither side expects a negotiated settlement before then.

- **The Public's Strength** — What cards does the public hold? Strong ones: The weight of opinion, the power of its elected representatives in government. The public's strength in labor matters has been shown before—in passage of the Taft-Hartley Act to remedy union abuses of power, in passage this year of the Landrum-Griffin amendments to T-H to deal with corrupt union leaders.

The public's power may show even before Congress has a chance to act; the union members, influenced by public opinion, may vote in large majority to accept the last company offer. But most labor observers would be surprised by that development. One told STEEL: "Union members are being barraged with arguments from management, the union, and the public. Even though most steelworkers would hate to go back on strike and even though many will think the Nov. 15 offer is reasonable, I believe that the majority will not want to repudiate their union by voting 'yes.' In the voting stage of the game, the union is using the most effective argument because it can be the most emotional—'a vote for the last company offer is a vote against your union.' "

- **Stumbling Block**—In the round on voting, a royal flush in the union's hand could still beat the public's four aces. U. S. officials claim that USW leaders are under no legal obligation to follow the will of the majority voting in January, even though they may be under strong moral pressure to do so.

So the odds are that the public will have to play its winning hand after the voting. It will have to play through its agents in government. What do they think should be done?

- **Labor Secretary James Mitchell**—He believes one of these methods could be used to break the stalemate: A mutually agreed upon nonpartisan board could recommend settlement; both sides could agree to submit the problem to binding arbitration; Chief Federal Mediator Joseph Finnegan could recommend a settlement.

- **Commerce Secretary Frederick Mueller**—"We might explore further whether it would be more in the public interest to decentralize the process of collective bargaining in basic industries, so that the employer group of a company could bargain directly with a union representing its own employees and not be forced to deal with industry-wide unions. Such decentralization might prevent the heads of international unions from calling out the almost total labor force of an entire basic industry and thus paralyze the whole nation's economy."

- **Sen. John F. Kennedy (D., Mass.)**—"Congress most certainly will act if a settlement does not occur before the injunction expires. My (labor) subcommittee will have recommendations for consideration early in the session. I doubt if Congress would require compulsory arbitration."

- **Representative Barden** — "The government will not stand aside if this thing reaches the proportions of a national emergency, and it could easily do that. There will be rumbling in Congress regardless of what happens because of what might happen another time."

- **Sen. Winston L. Prouty (R., Vt.)**—"Public opinion will compel action by Congress to settle the dispute. I would favor compulsory arbitration only as a last resort."

- **Sen. Jennings Randolph (D., W. Va.)**—"There is merit in suggestions that the President be given authority to take alternative courses of action, depending upon the degree to which the national interest is jeopardized in labor-management disputes."

- **Rep. Phil M. Landrum (D., Ga.)**—"My opinion suggests the possibility of a strike vote on the last (industry) offer before the strike is called."

- **Rep. William H. Ayres (R., Ohio)**—"If agreement is not reached (by Jan. 26), management and labor should be called before the Labor Committee. After facts are known, legislation to extend the injunction time 30 days should be passed. In the future, workers should be given the opportunity to vote on the best offer soon after the strike is called."

- **Rep. Edgar W. Hiestand (R., Calif.)**—"I believe unions should be made subject to existing laws, including antimonopoly laws, to which other organizations and businesses are subject."

- **Rep. Robert N. Giaimo (D., Conn.)**—"An emergency could require seizure of the steel industry or the imposition of compulsory arbitration."

Thus congressmen definitely believe some legislation will be needed to end the impasse if the workers' votes can't do it. But the legislators differ widely on what the law should be. Especially significant are Senator Kennedy's views because his subcommittee initiates labor legislation in the upper house.

- **Fear of Congress**—Many in the public echo Secretary Mitchell's fear that if the injunction expires without a contract Congress might act in a way that would harm both sides. Nine of ten metal users contacted by STEEL support the steel industry's labor stand and are alarmed over the possibility that Congressional action might force the steel companies to back down.

Still another segment of public opinion thinks that the steel situation could lead to some needed, far reaching reform. What this group thinks is wrong is expressed in this editorial in the Dec. 4 *Cleveland Plain Dealer*:

"President Eisenhower said: 'I believe that the day we abandon honest free collective bargaining is going to be a sad day for the U. S.'

"There are two inaccuracies in this statement. One is that there has never been such a thing as free collective bargaining since the Wagner Act went into effect. The word 'free' implies that both parties to a labor negotiation have some freedom of choice. But the employer has no freedom of choice, nor does the employee who objects to being represented by the union . . . So the phrase should read 'compulsory' collective bargaining.

"The second inaccuracy is that what goes on in a labor-management negotiation is not bargaining at all. The word 'bargaining' implies . . . give and take on both sides. But in a wage negotiation such as the current steel dispute, the union makes 'demands,' refuses to give anything in return, and threatens to shut down the industry if the demands are not granted.

"That . . .is collective blackmail. So the phrase should be amended again to read 'compulsory collective blackmail.' "

The cards are being dealt now. How will they fall?

Other Labor Talks Share Spotlight

WHILE THE TENSION of the steel stalemate mounts, the labor spotlight focused on several other important developments last week.

American Can Co. and Continental Can Co. reached agreements with the United Steelworkers of America on a three-year contract. American Can officials said the package amounted to 28.2 cents, with direct wage hikes averaging about 8 cents per year.

(Following the settlement, American Can announced that it would raise prices slightly on Jan. 15.)

In commenting on the settlements, USW President David J. McDonald said they should affect the steel talks because the can industry is a large consumer of steel. September earnings in the can industry averaged $2.73 per hour, including overtime and other pay premiums. Earnings in the steel industry are already 43 cents above that, say steel officials.

Lukens Steel Co.'s interim contract was ratified by its locals. The local issues were settled, and the agreement calls for including wages and benefits resulting from settlement of the major steel negotiations. Lukens officials report their contract doesn't contain Section 2B, which is the main stumbling block in the steel talks. The agreement will permit Lukens to keep operating should the walkouts in the major firms be resumed.

Wage negotiations involving the Aluminum Co. of America and the Steelworkers reopened at midweek. Aluminum contracts expired July 31 but were extended. Traditionally, this industry's settlements have closely followed those in steel. The USW can be expected to try for a settlement paralleling the contract signed with **Kaiser Steel**.

46.9%

Of Metalworking Plants Will Expand in '60

Of those:

- **14.3% will build new plants**
- **36.7% will build additions**
- **70.9% will buy equipment**

Metalworking Will Up Capacity 4.5%

ALMOST HALF the nation's metalworking plants—about 14,500 of them—will expand in 1960. Production capacity will be lifted 4.5 per cent—the biggest increase since 1957. That's what STEEL has learned in a survey of metalworking plants across the nation.

• Smalls to Grow Most—Plants employing less than 100 have the most optimistic plans; they'll hike capacity 5.1 per cent. Plants employing 100 to 500 will lift capacity 4.1 per cent; those employing 500 or more, 2.8 per cent.

• The Big Spenders—Manufacturers of electrical machinery and equipment are embarking on a spree of plant building and equipment buying. They'll hike their production capacity 8.5 per cent during the coming year. By industry groups, here's how much capacity will be boosted in 1960:

Primary metals	4.5%
Fabricated metal products	4.0
Nonelectrical machinery	3.2
Electrical machinery & equipment	8.5
Transportation equipquipment	4.1
Instruments, related items	4.5
Other metalworking	4.7

• Equipment Is Big Factor—Equipment will be a major factor in proposed expansions. Of the plants expanding in 1960, here are the percentages in various categories that will be adding new equipment:

Primary metals	72.1%
Fabricated metal products	70.6
Nonelectrical machinery	71.8
Electrical machinery & equipment	79.1
Transportation equipment	67.7
Instruments, related items	57.4
Other metalworking	60.1

• Plant Building—Of the metalworkers who will expand capacity next year, 14.3 per cent will build new plants, 37.7 per cent will add to existing installations. Here's the breakdown for those building new plants:

Primary metals	15.6%
Fabricated metal products	6.4
Nonelectrical machinery	13.1
Electrical machinery & equipment	21.2
Transportation equipment	18.7
Instruments, related items	31.0
Other metalworking	19.4

• Capital shortages—About 1 of every 6 plant managers reports that capital shortages will hold up planned expansions in '60. Especially hard hit are the plants employing less than 100; 22.4 per cent of them say they'll have to hold back expansions due to lack of funds.

Streamlined Regulation To Speed Defense Buying

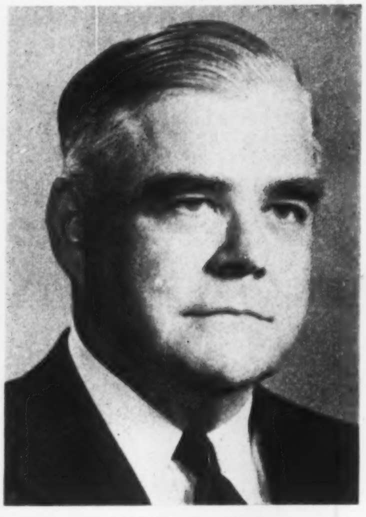
A revised regulation simplifying buying procedures by contractors doing defensework is announced by the Business & Defense Services Administration of the Commerce Department.

• **What Is It**—The basic regulation requires prime contractors and subcontractors of the Department of Defense, the National Aeronautics & Space Administration, and Atomic Energy Commission to employ the priority powers of the Defense Production Act on their purchase orders for materials needed to meet delivery schedules on defensework.

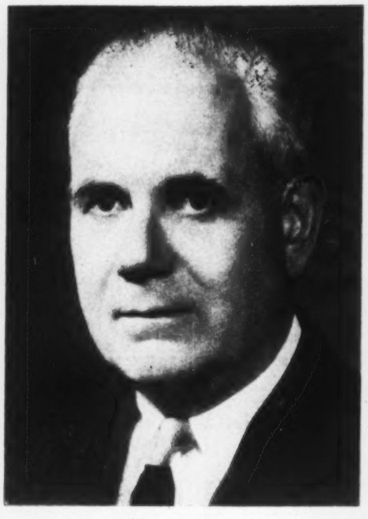
• **What It Will Do**—The changes will make operations easier for defense contractors by cutting down on paperwork and will provide greater assurance that their requirements for materials, components, and subassemblies will be met on schedule. Contractors must place an appropriate program identification and certification on their defense purchase orders. When properly identified, they must be given delivery preference over commercial business by the suppliers.

• **Who Is Qualified**—The priorities are assigned to prime contractors only by government agencies. The prime contractors note the priority identification on their contracts and purchase orders which they place to complete the contracts. The subcontractor and other suppliers must use the customer's priority identification on their orders for the products and materials needed.

• **Changes Affect Producers**—Producers of steel, copper, aluminum, and nickel alloys are required to accept properly identified top priority orders for which the use of the symbol "DX" has been authorized, without regard to leadtime, unless it is impractical to do so. Nonnickel-bearing stainless steel, aluminum molten metal, aluminum foil and powder (including flake and paste) have been added to the list of controlled materials. Removed from the list are all-steel castings and nickel alloy castings.



RALPH L. GRAY



LOGAN T. JOHNSTON

Armco Executives Move Up

TWO WIDELY KNOWN steel executives were promoted to top management posts at Armco Steel Corp. by the board of directors last week.

Ralph L. Gray will become chairman on Jan. 1. Logan T. Johnston becomes Armco's president on the same date.

A member of the board of directors since 1940, Mr. Gray has served as Armco's president since 1956. An engineering graduate of Washington University, his entire career has been in the steel industry. He was assistant to the president of the Kansas City Bolt & Nut Co. when its name was changed to Sheffield Steel Corp. in 1925.

Mr. Gray became president of Sheffield Steel in 1930, shortly after it became a subsidiary of Armco. He headed Sheffield for 24 years—during its greatest growth—and was elected executive vice president of Armco in 1954.

Mr. Johnston earned his degree at Carnegie Institute of Technology. He joined the sales staff of Columbia Steel Co. in 1925 and two years later the firm was merged into Armco. In 1930 Mr. Johnston moved into Armco's headquarters at Middletown, Ohio, and organized the firm's railroad sales division.

He was named Armco's general manager of sales in 1947, and in 1952 was elected vice president in charge of distribution. He continued to direct the firm's sales activities after his election to executive vice president last year.

Michigan Seamless Tube Plans Expansion

PLANS for a 70 per cent increase in production capacity are announced by Michigan Seamless Tube Co. Cost of the program: $5.5 million.

The expansion, scheduled for completion next year, will hike the firm's capacity to 95,000 tons from its present 55,000 tons, says William McHattie, president.

Major element in the expansion is the construction of a mill at the Gulf States Div., Rosenberg, Tex. This division converts rounds shipped to it from the Michigan Div. in South Lyon, Mich. The Texas installation will feature a new, 1800 ton German-built vertical extrusion press. "This press has the ability to extrude all types of steel, including stainless and special alloys, that usually can't be handled on conventional piercing mills," the president states.

Balance of the program will include new drawing and finishing equipment to handle the billet capacity freed in Michigan after the Texas plant is in operation.

How to Beat a Price Hike in Buying Parts and Materials

BERT L. HANSEN

THREE METALWORKING COMPANIES learned that the price of a component they purchased was to be raised 6 per cent. One firm immediately placed an order, at the old price, for four times its normal order quantity. Another firm did nothing. Both lost money.

The third company, however, saved several thousand dollars by ordering the optimum amount at the old price. It used a scientific—and fairly simple—method that you can use too to beat an imminent price increase. The method was explained to a group of business executives by Bert L. Hansen, director, American Management Institute, Cleveland. Here's how it works:

● **Step 1**—You learn that the price of a part or a type of material you buy will be increased. (A careful and continuing analysis of market trends will tip you off to many coming price hikes before they are put into effect.) As an example, we'll assume that the price of steel strip will be increased 5 per cent.

● **Step 2**—Find out how much the price increase will add to your yearly costs for that material. To do that, multiply the percentage of the price increase times the monthly usage of the item (in dollars) times 12 (the number of months in a year). For our example, we'll assume that your monthly usage of steel strip is $2000 worth. So multiply 0.05 (the percentage of the price increase) times $2000 times 12. Answer: $1200. That's what the price increase will add to your yearly cost for the item.

● **Step 3**—Find how much greater your carrying costs will be at the new price vs. the old. To do that, add 1 to the percentage of the price increase—to find the value of the item after the price increase, relative to its value at the old price. In our example, that would be 1 plus 0.05, or 1.05.

Multiply that sum times your annual carrying cost for the item as a percentage of its value. (If you don't already know your carrying costs, you find them by totaling these costs: Interest on capital invested, taxes, insurance, housing, handling, taking physical inventory, other clerical costs, deterioration, and obsolescence.) In our example, we'll assume your annual carrying cost is 16 per cent of the item's value. So multiply 1.05 by 0.16. Answer: 0.168.

● **Step 4**—Divide the amount the price increase will add to your yearly cost (answer in Step 2) by the cost, percentagewise, of holding the item in inventory (answer in Step 3). In our example, we divide $1200 by 0.168. Answer: $7143. That's the optimum additional amount of the item to order.

● **Step 5**—To find the optimum amount of the item to order at the old price, you add the answer you got in Step 4 (the additional amount to buy) to your normal order quantity for the item. For our example, we'll assume that you normally order four months' supply of the item at a time. That's $8000. So add $7143 to $8000, and you have the optimum amount to order—$15,143 worth. Ordering less than that would mean you weren't taking full advantage of your opportunity to beat the price increase. Ordering more would mean that you would have to pay more in carrying costs that you would save by buying at the old price.

● **Formula**—The formula we just used (and which you can use to save money by beating price hikes) is:

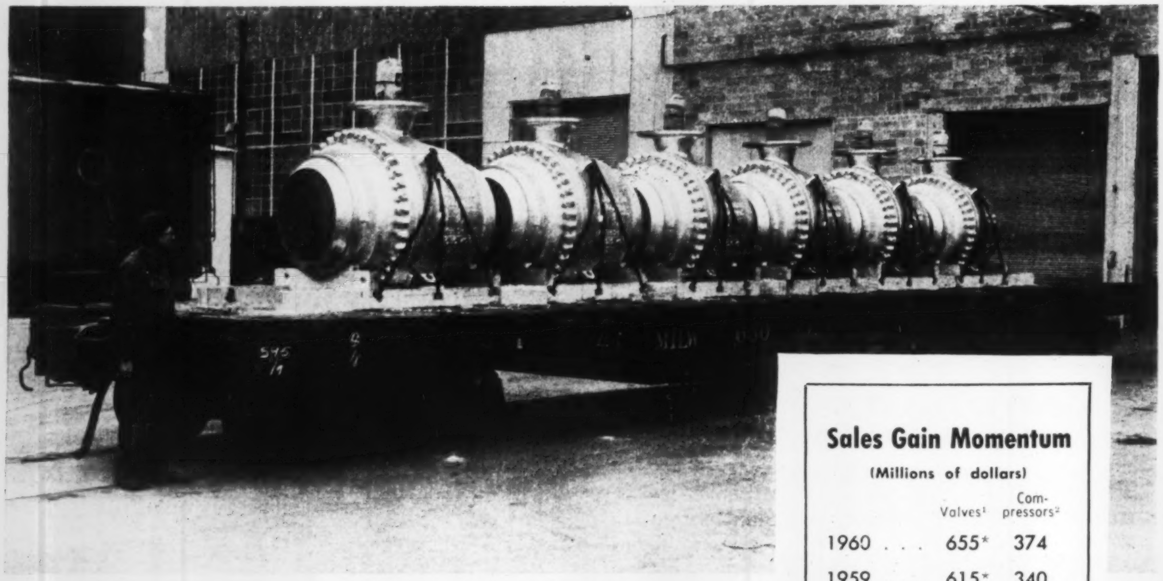
$$Q_2 = \frac{\text{Fraction price increase} \times M \times 12}{1 + \text{fraction price increase} \times I} + Q_1$$

Q_2 is the new order quantity (in dollars).
Q_1 is the normal order quantity (in dollars).
M is the monthly usage of the item (in dollars).
I is the annual carrying cost for the item as a percentage of its value.

● **Quick Method**— There's a faster method of doing the same thing, though it's not quite as accurate. Mr. Hansen explains it this way: Divide the percentage of the price increase by the monthly carrying cost for the item, as a percentage of the item's value. In our example, we would divide 0.05 (the percentage of the price increase) by 1.33 (the monthly carrying cost). Answer: About 3.7. It means you should order an additional 3.7 months' supply.

● **Checking Accuracy**— Let's check the quick method against the formula method. By the quick method, we found we should order 3.7 months' supply. That would be $7400 worth (3.7 times $2000, the monthly usage). Since we get $7400 one way vs. $7143 the other, the difference is less than 4 per cent.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Sales Gain Momentum

(Millions of dollars)

	Valves[1]	Compressors[2]
1960 . . .	655*	374
1959 . . .	615*	340
1958 . . .	585*	320
1957 . . .	650	375
1956 . . .	610	357

(1) Excludes plumbing.
(2) Excludes refrigeration.
*Estimated by STEEL.
Source: U. S. Department of Commerce.

Valve and Compressor Firms Set Sights on Banner Year

LOOK FOR record-equaling sales of valves and compressors next year if labor disputes with steelworkers, railroad employees, and longshoremen are settled promptly.

New peaks are possible because sales normally parallel trends in:

- Spending for new plant and equipment—expected to jump from this year's $33.3 billion to an all-time high of $38 billion.
- Private nonresidential construction—expected to climb from $8.6 billion to $10.2 billion.

If sales rise as much as the business indicators suggest—15 per cent in plant and equipment spending, 19 per cent in nonresidential construction, 8 per cent in GNP—they'll break all previous records. An increase of only 6 per cent would set a new high for valve sales ($652 million), and that's the least leading producers are forecasting. Most firms look for a 10 per cent gain.

Compressor manufacturers figure that 1960 sales will top this year's by 10 per cent and be second only to 1957's. Some expect gains of as much as 30 per cent, but most observers are convinced that no company could do that much better without taking business from a competitor. The market is expanding gradually.

• **Pipelines Push**—Most promising of the growth markets for valves and compressors is the natural gas industry. The American Gas Association estimates that transmission companies and distributors will install 24,500 miles of new lines and spend a record $1,898 million for construction next year. In addition to requiring large quantities of pipe, new transmission and distribution systems will entail heavy spending for valves, compressors, meters, and regulators. Expansion of underground storage facilities will also help compressor sales because gas must be forced into caverns under pressure.

• **More Horsepower**—To increase the gas carrying capacity of their pipelines, transmission companies can either boost compressor horsepower or install second lines ("loops") between compressor stations. Engineering considerations make one method or the other preferable, but in most cases capacity is first increased by forcing more gas through the original line. Reason: Even though compressor stations aren't cheap ($150 per horsepower, or $750,000 for a typical installation), they require less investment than looping, with its heavy expenditures for pipe, valves, connections between lines, and labor.

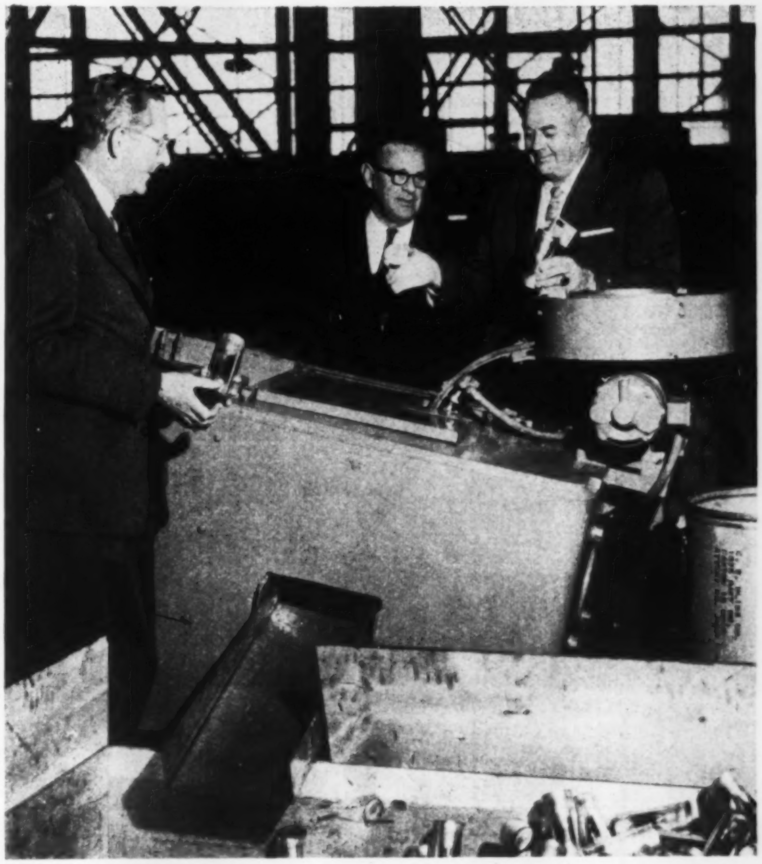
• **More Mileage**—Since there are practical limits to expansion by higher compression, transmission companies eventually start looping—the equivalent to double tracking in railroads—and that's what they'll be doing in 1960. It's estimated that 80 per cent of next year's new pipeline mileage will be in loops, only 20 per cent in extensions to areas that are not now getting gas service.

The decision to increase capacity on a line by looping instead of by boosting compressor horsepower is good news for valve manufacturers, bad news for compressor firms. Reason: To double capacity by adding a parallel line, a transmission company needs only to double its horsepower. To double the capacity of a present line, it must quadruple the horsepower.

Compressor manufacturers believe the Supreme Court's reversal of the so-called Memphis Decision (Dec. 8, 1958) spurred pipeline construction and caused the Federal Power Commission to speed up its handling of programs submitted for approval. In the first ten months of this year, the FPC approved 161 applications with an aggregate cost of $1,053 million, involving 10,751 miles of pipeline and 640,499 compressor horsepower. Unfortunately, not all the horsepower will be "new." Says a leading compressor manufacturer: "The cheapest way to increase horsepower is by turbocharging, boosting the output of older equipment through better engineering."

• **Other Market Growing** — Although valve manufacturers regard the natural gas industry as having the greatest potential for 1960, they also expect big gains in sales to waterworks and chemical plants. The steel industry is counted on for steady replacement business. Other markets—original equipment, oil refining, air conditioning, pulp and paper—will be the same as this year's or moderately better.

• **Price Outlook** — Don't be surprised if prices go up next year. There have been no across-the-board increases since October, 1958 (when prices were boosted about 5 per cent), but recent advances in gate valve quotations may be indicative of an uptrend. The outcome of steel labor negotiations will, of course, have an important bearing. If the union wins a contract that requires the steel companies to raise prices, valve and compressor manufacturers will have to follow suit. They might raise their prices even if steelmakers hold the line. Reason: Many of them have USW contracts and would be obliged to pay higher wages. Look for prices to go up 5 to 10 per cent.



Messrs. Burgoyne, Meyer, Porterfield check press making . . .

120 'Impacts' per Minute

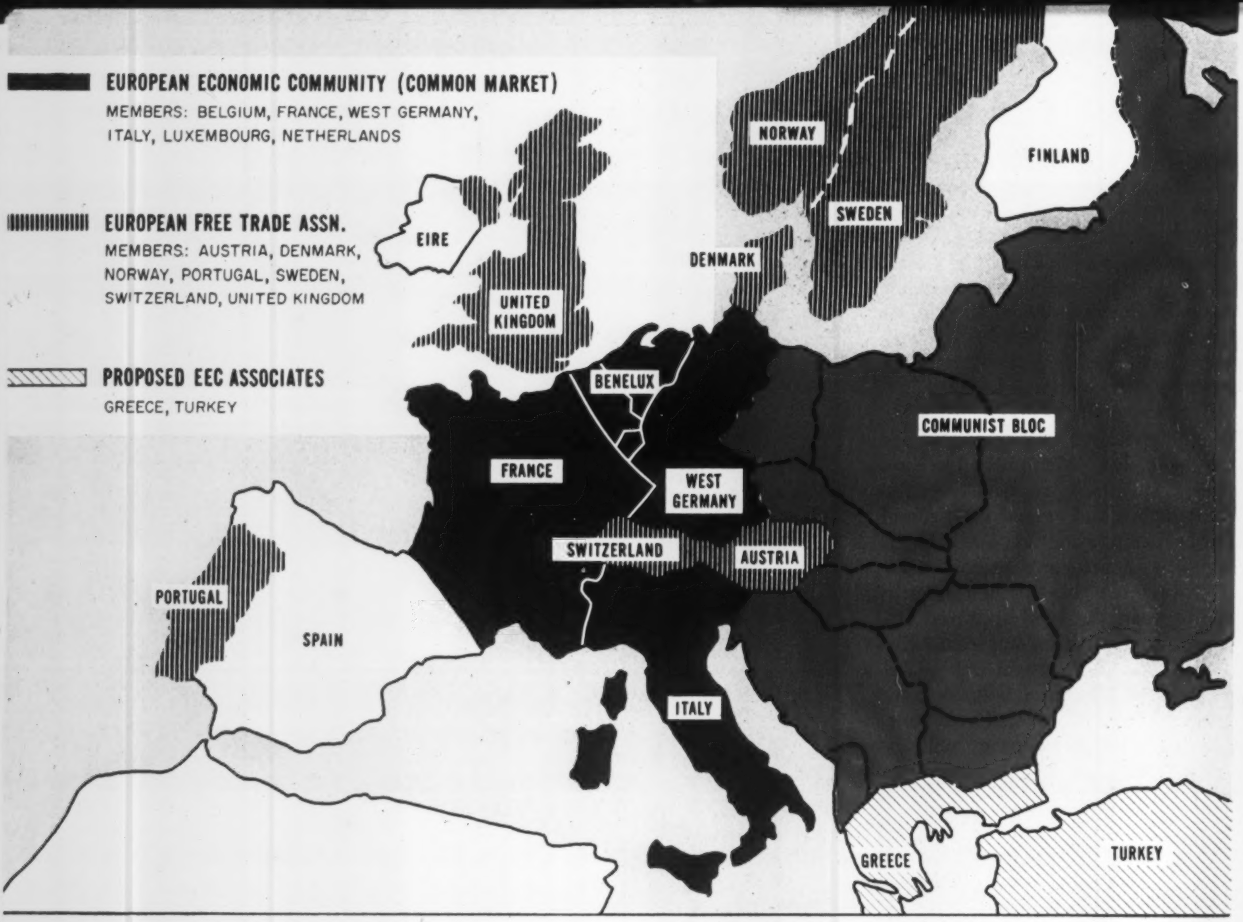
ALUMINUM IMPACT extruding of containers took a big stride with the introduction of a new 400 ton press by E. W. Bliss Co. Officials claim it's twice as fast as any other available equipment—it will impact extrude 11 ounce cans at speeds from 40 to 120 per minute.

The press (a straight side, single action machine inclined 13 degrees from the horizontal) was delivered to Adolph Coors Co., Golden, Colo. Aluminum International Inc., a subsidiary jointly owned by Coors and Beatrice Foods Inc., has spent $3.5 million in the development of a completely automated impact extruded can line at Coors.

• **Complete Facility** — Coors (see STEEL, Jan. 12, p. 70) is already extruding beer cans on two German-built presses. It also has a continuous strip casting facility to produce the 2S aluminum blanks—2½ in. in diameter by ⅛ in. thick—used to make the cans.

Wall thickness of the extruded can is 0.010 in.; the bottom, which has a reinforcing rib, is 0.025 in. Finishing operation includes trimming and flanging.

Jack Porterfield, chief engineer for Aluminum International, says that when two of the Bliss presses are installed at Coors, can manufacturing costs will be lower than those of conventional three piece steel can lines. A. S. Burgoyne is manufacturing vice president of Bliss; B. E. Meyer is sales manager of its Container Machinery Div.


EUROPEAN ECONOMIC COMMUNITY (COMMON MARKET)
MEMBERS: BELGIUM, FRANCE, WEST GERMANY, ITALY, LUXEMBOURG, NETHERLANDS
EUROPEAN FREE TRADE ASSN.
MEMBERS: AUSTRIA, DENMARK, NORWAY, PORTUGAL, SWEDEN, SWITZERLAND, UNITED KINGDOM
PROPOSED EEC ASSOCIATES
GREECE, TURKEY
NORWAY
FINLAND
SWEDEN
EIRE
DENMARK
UNITED KINGDOM
BENELUX
COMMUNIST BLOC
FRANCE
WEST GERMANY
SWITZERLAND
AUSTRIA
PORTUGAL
SPAIN
ITALY
GREECE
TURKEY

EEC-EFTA Rift Threatens European

DESPITE some soft spots in the economy, notably coal and shipbuilding, Western Europe is experiencing a prosperity unequaled in its history. Industrial production is up 39 per cent over 1953 levels (U. S. output has risen 14 per cent during the same period).

The European Coal & Steel Community expects to produce a record 68.9 million tons of crude steel this year, 8 per cent more than in 1958 and 4.5 per cent more than in 1957, the previous high.

Employment is high with some areas suffering serious labor shortages. Major exception: Italy. In May, 1.7 million (8.5 per cent of the labor force) were unemployed. But even Italy reports shortages in some skilled categories.

Gold and dollar reserves have built up. Prices are up too. But wages have risen (although they're still less than half of U. S. rates) to a point where a high consumption durable goods market is possible. The number of cars on the highways in Common Market nations has nearly tripled since 1952. (In England, the number has increased 80 per cent.) TV antennas are incongruously sprouting from ancient homes.

• **Europe Split**—On Nov. 20, Free Europe was divided into two blocs which can do much to promote the continent's prosperity and unity or plunge it into a disastrous trade war. A treaty was signed by Austria, Britain, Denmark, Norway, Portugal, Sweden, and Switzerland forming the European Free Trade Association. To be ratified in March, it provides for the gradual elimination of trade quotas and tariffs among the seven members by 1970, beginning with a 20 per cent reduction on July 1, 1960. No common external tariff wall is planned. The EFTA, in effect, sets up another huge preferential tariff zone similar to the European Economic Community (Common Market).

The EFTA encompasses some 90 million people and accounted for 10 per cent ($1.4 billion) of U. S. exports last year. The Common Market has a population of 170 million and took 15 per cent ($2.4 billion) of America's '58 exports.

Free Europe's Crude Steel Capacity

(In millions of tons)

	1959	1965
West Germany*	**32,010**	**37,900**
United Kingdom	**24,900**	**31,000**
France	**16,200**	**23,000**
Italy	**8,190**	**11,000**
Belgium	**8,070**	**8,500**
Luxembourg . .	**3,683**	**3,900**
Sweden	**3,100**	**4,200**
Austria	**2,580**	**3,200**
Spain	**2,100**	**3,500**
Netherlands . .	**1,720**	**2,500**
Norway	**550**	**800**
Turkey	**300**	**900**
Finland	**270**	**600**
Switzerland . .	**270**	**400**
Denmark	**270**	**350**
Greece	**120**	**150**
Portugal	**. . . .**	**400**
Totals	**105,333**	**132,300**

*Including Saar.

Source: Estimated by United Nations.

Unity

• **EFTA Aims** — The association project was launched early this year due to the failure of the "outer seven" (EFTA) to agree on terms for a European-wide combination with the "inner six" (EEC). Although the two groups form somewhat competitive trade areas, the outer seven regard their association, at present, as merely a step toward an agreement among all 18 countries of the Organization for European Economic Co-operation (OEEC). The EFTA follows the British concept of "free association." Unlike the Common Market, it does not plan any degree of economic or political integration, and does not feature the intricate governing body of the EEC.

The Common Market was formed in 1958 and initiated its first tariff and quota changes on Jan. 1 of this year (see STEEL, Apr. 13, p. 65). Initially, internal trade barriers were to be eliminated and a common external trade barrier established in four stages to be completed within 12 to 15 years. The program was stepped up as early moves proved successful. Now, Belgium has proposed completion of the plan by 1966.

• **Future Cloudy** — Many U. S. businessmen are apprehensive. They realize that they must now contend with two groups which, although they promise to accelerate expansion and open new market opportunities, will discriminate to some extent against outsiders. Some executives say trade barriers between the blocs may force them to create costly duplication of facilities to successfully tap the markets in each area. Then, if the groups settle their differences, dual production facilities will be unnecessary. In the long run, it appears that the EFTA will discriminate less against U. S. goods.

Many observers believe it will be a long time before the groups settle their disagreements, suggesting that Britain is using the association as a tool to force a change of heart by France, which blocked its earlier "free trade" proposals (i.e., for the EEC to joint OEEC in a single trade group, with the countries outside the Common Market exchanging internal trade relations with the inner six).

OEEC sees itself assuming the role of moderator. Skeptics predict a decline in the influence of OEEC as a result of the new group. Optimists, even within the EEC, feel there will be growing pains, but foresee a bright future sparked by stronger European unity.

If the two organizations fail to establish total liberalization of world trade, some officials fear they may put a damper on U. S. efforts to overcome a deficit in its international trading accounts. Others are worried that the economic cleavage may endanger the political solidarity of the U. S. subsidized defense setup of Europe, NATO.

Here's a rundown on Europe's leading metalworking nations:

• **Belgium**—U. S. orders for steel have slackened since earlier in the year when firms were stockpiling for the strike. But domestic demand and that from the ECSC nations is up, keeping production at high levels. Although the U. S. steel strike created an artificial demand, Belgian steelmen believe that this year's recovery from the 1958 recession is solid and a high level of production will be maintained throughout 1960. They feel the U. S. strike merely precipitated the new demand at a slightly earlier date.

Greatest demand is for concrete reinforcing bars, merchant bars, black sheets, wire rods, and drawn wire. Public and private construction are heavy, bolstering domestic demand.

Investment emphasis is being placed on improvement of steelmaking processes rather than building new steelworks. Great hopes are held for the L-D oxygen process.

The monstrous coal surplus is the only blot on the otherwise bright Belgian banner. However, a plan agreed to by the government and the ECSC High Authority will implement the gradual reduction of Belgian mine capacity. Fifteen pits will have been closed by the end of the year, 11 will be closed in 1960, five in 1961, and three after August, 1962. The closings are expected to reduce coal production by 5.5 million tons a year under the 1957 level (28.9 million tons) and cut employment by 27,000 mineworkers. A joint ECSC-Belgian financed fund will provide grants to displaced workers who are not immediately absorbed by other industries.

• **France** — Industrial production has sped along at a fairly good clip throughout most of the year. Total steel production for the year is expected to top 16.5 million tons, 440,000 tons over the 1958 level.

Investment in the steel industry will reach a high this year. An annual capacity of 18.5 million tons is foreseen for 1961-62. Sinter, which accounted for 8 per cent of all metallics charged into furnaces in 1958, is expected to account for 25 per cent in 1962. Total sintering capacity is seen at 13 million tons by then.

In addition to rising prices, the machine tool industry is creating

Export Market: Labor Must Help Keep It

WILLIAM E. UMSTATTD

THE CREAM of our earning power and productive capacity is being skimmed off by foreign manufacturers, declares William E. Umstattd, chairman, Timken Roller Bearing Co., Canton, Ohio.

The biggest profits, says Mr. Umstattd, come from the last 10 per cent of production which, in the past, has been for our export market. Now, the U. S. is becoming an importer instead of an exporter.

Lower wage rates and better utilization of machinery account for the ability of foreign producers to challenge this country's role as an exporter. Mr. Umstattd cites hourly wages of 75 cents in Italy, 87 cents in Germany, and $1 in Belgium, France, and Sweden.

Nonutilization of equipment is getting to be a tremendous expense in the U. S., he emphasizes. The 10 and 15 minute delays after the opening whistle and before quitting time mount up when multiplied by three shifts per man. In foreign plants, employees work right up to and through the blowing of the whistle; they don't stop in anticipation. Many firms are establishing plants overseas for these reasons, he warns.

Mr. Umstattd points out that we no longer lead the world in technology. Foreign products and production techniques are as good, and in some cases better, than ours, he says.

"I don't mean the U. S. is on the edge of bankruptcy," states Mr. Umstattd. "But there is a renaissance in Europe. If we're not careful, we'll not only lose that market, but others as well. I hope the workers realize that they must utilize capital equipment and throw themselves into their work or we'll see our export business lost. And the jobs will go to Dusseldorf and Tokyo instead of Cleveland and other U. S. cities."

Mr. Umstattd expressed his views at the annual Electric Furnace Conference of the American Mining, Metallurgical & Petroleum Engineers in Cleveland.

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concern. Production will be down about 10 per cent this year. Reduced orders from Spain are cited as one reason.

Most exciting news of the year was this month's opening of an oil pipeline from the Sahara to France. Over 3.5 million barrels of crude will gush through the line in its initial month of operation. French crude oil production was 16.9 million barrels last year, up 45 per cent from 1957.

• **Italy** — Industrial production maintained an upward trend in the first seven months of this year, rising 8 per cent over the same period of 1958. Foreign trade declined in August, but less than the seasonal norm. The Italian steel industry, which suffered more than any in Europe from the '58 recession, was up 2.3 per cent in the first nine months over the like period of last year. Total 1958 output was 6.9 million tons, down from the 7.5 million tons produced in plush 1957. The Finsider Group (see STEEL, Feb. 9, p. 59) accounts for 55 per cent of crude steel production and 85 per cent of pig iron output. Extensive expansion programs are underway, especially for making flat products.

Foreign investments in Italy are skyrocketing, rising to $126.3 million in the first six months of this year compared with $79.2 million in the same period of 1958 and $6 million in all of 1951. Italy's machine tool industry will gross about $60 million this year, of which $25 million is export trade.

• **Luxembourg**—The steel industry, Luxembourg's economic backbone, operated at full capacity in the first half with shipments up 47 per cent over the same period of 1958. Production will probably reach 3.7 million tons for the year. Although a large portion of the activity resulted from heavy U. S. demand prior to the steel strike, continued high production is expected throughout 1960. Shipments to the U. S. may be as high as 250,000 to 300,000 tons this year, quite a jump from the 173,000 tons shipped in 1958.

Although modernization programs underway in the steel industry will result in greater capacity, the nation's three steel producers are aiming at development to achieve lower production costs and higher quality. Steel accounts for 55 per cent of the country's industrial employment, 70 per cent of the total value of industrial production, and 90 per cent of the value of its exports.

• **United Kingdom** — The British economy was well over the recession by midyear and appears to be approaching prosperity unparalleled in the postwar period. One reason for industry's optimism: The Conservative victory in the recent general election. The threat of nationalization has subsided and longer range planning is now feasible.

Although auto builders are facing

a sheet shortage and upped construction has increased pipe orders, home market demand by the railroad, mining, and shipbuilding industries has not been sufficient to warrant full capacity steel production. But output is expected to reach record levels in 1960 as the outlook for virtually all branches of metalworking is bright. Acceleration of railroad modernization and new government orders for shipbuilders is expected to boost those industries. After three years of steady decline, the trend in machine tool orders has been reversed. Industrial building this year is about 30 per cent ahead of 1958.

As on the continent, surplus coal is a problem. Stockpiles equaled 35.7 million tons in early November. They're still rising by 287,000 tons weekly. The rapid change to oil as an industrial fuel, and to a lesser extent, for domestic purposes, and a hot, dry summer have accentuated this growing problem. Plans call for the closing of many marginal collieries next year, dropping output from this year's level of 207 million to 195 million tons.

• **West Germany**—Industrial production set a record in October, accelerating the steel and industrial boom which observers say will last far into next year. The boom originated abroad, mainly in the U. S., but the brisk pace is mainly based on inland orders. Steel production should total 28.4 million tons this year compared with 27 million tons in 1958. Since the Saar has been integrated into the German economy (see STEEL, Aug. 31, p. 39), another 3.3 million tons can be added to the 1959 total.

Although investment in the steel industry has been declining since 1957, expansion will be stepped up next year. Emphasis will be on sintering plants, to be increased 50 per cent by 1963. Purpose: Reduced production costs. Large increases in electric steel capacity for improved quality are also seen. Sheet capacity, including hot and cold rolled, is also to be expanded. Employment is at a high level. Coal miners displaced by mine closings have been immediately grabbed by other industries. Between 12 and 15 mines will be closed next year, dropping coal production from 125 to 120 million tons annually.

New Distribution Setup Boosts Slocomb's Sales

EXCHANGING a haphazard relationship with distributors for one with more concentration and better co-ordination has increased sales for J. T. Slocomb Co., Glastonbury, Conn.

The New England micrometer manufacturer adopted a program last May to provide equal sales territories, fair commissions and discounts, and thorough factory training and field supervision. The effectiveness of the plan was bolstered by an expanded line of micrometers and promotion aimed at more rapid turnover of distributor inventory.

Prior to this spring, anyone could carry the Slocomb line. Problem: Distributors often didn't push Slocomb products and carried inadequate inventories.

• **Groundwork**—A market study, based on published information such as four digit SIC codes, determined the important marketing areas and the number of suppliers required to adequately cover each area. The number and size of plants were influencing factors. Each plant was given a weight index.

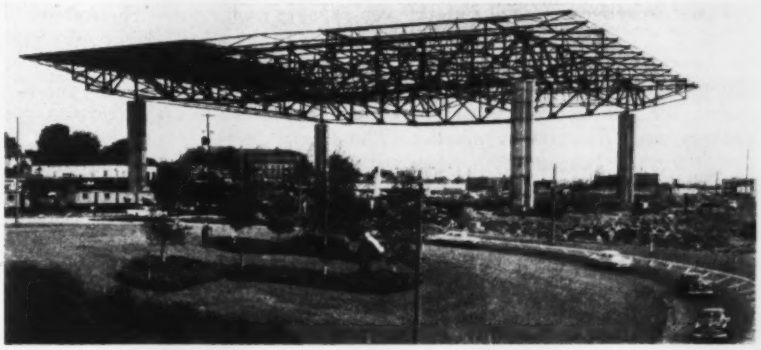
The country was divided into 18 basic trading areas. A factory representative is assigned to each region. He is advised where, and usually how many, distributors should be appointed.

• **Distribution Setup**—Distributors are classified as "selected" or "franchised." One selected distributor is in each area. He maintains a fixed inventory of Slocomb products and receives a 25 per cent resale discount. Franchised distributors agree to promote Slocomb goods but do not carry a minimum inventory. They buy stocks from selected distributors or the factory. The selected dealer gets a 5 per cent override on direct shipments from the factory and earns a 10 per cent discount when he sells the goods himself.

From the factory representatives' point of view, the territories are equal. Each area has about the same number of prospective customers. So sales quotas are easy to figure.

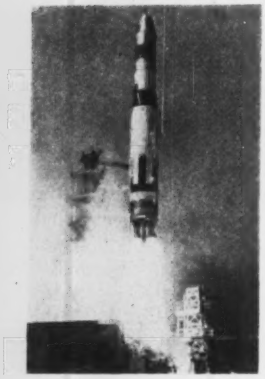
Distributors are trained at the Glastonbury plant. After a month in the territory, they are visited by a factory representative who helps smooth out any difficulties. When a home office man travels with a selected or franchised dealer, he is also accompanied by the local factory representative.

Niles Brook, vice president-sales, reports: "Most of our sales are presently through franchised distributors. This is because the program is new, and we still have to fill our selected distributor quota. But within 18 to 24 months, we expect at least 85 per cent of our sales will be through selected distributors."



STEELWORK covering the $8 million Memorial Coliseum, Portland, Oreg., will permit interior work to continue through the winter. The Coliseum will be opened to the public next November

Steps in Air Force Weapon System Planning



- **Development Plan Objectives.**
- **Study Requirements.**
- **Operational Requirements.**
- **Predevelopment Plan.**
- **Development Plan.**
- **Source Selection.**

Shifts Ahead in AF Procurement Policy?

METALWORKING firms concerned about more business from the Air Force can take hope from some recent developments in procurement practice.

The six steps shown above represent the route the AF follows in deciding upon a new weapon system. (Modern warfare is conducted by systems rather than individual weapons because of the technological complexity of missiles, or supersonic speed aircraft, atomic bomb delivery, electronics, and other equipment.)

Depending upon four situations, the AF arrives at Step 1 in its planning: The development plan objective. The four prerequisites to any plan are: Intelligence estimates of the strength of the enemy, the state of world politics, the money available for research into new weapons, and the state of weapons art itself.

The B-70 program was started formally two years ago because the AF at that time thought another bomber beyond the capabilities of the B-52 would be needed for the Strategic Air Command before all bombers were replaced by missiles. The special fuels needed for the "chemical" bomber were under development already and the cold war showed little sign of thawing; so the AF received an O.K. to go ahead.

But situations change: On Dec. 1, the AF announced that instead of a fleet of B-70s, we would have only two test models. Delivery was stretched out to 1963. All major subsystem development was "deferred." To some Monday morning quarterbacks, the reason for the decision was obvious. The B-70 is a good example of a weapon system. Each of its components had to be designed to fit the total complex.

Thus the first lesson to metalworking firms in AF procurement comes home. Despite the thoroughness of AF conceptual planning, a change in grand strategy can cancel out or drastically change a weapon system.

How AF Sources Are Selected

Step 2 in weapon system planning represents the first time contractors are called in by the AF. In most cases, they will be large firms with tremendous capability to develop whole systems. They are briefed by the AF on the initial study requirements.

With that background, the AF proceeds to set up its operational requirements (Step 3). They include such items as speed of the weapon, range, and bomb load. Working level AF personnel become more deeply involved in Step 4 where the Air Materiel Command and the Air Research & Development Command establish the cost of the program and schedule delivery. The final development plan (Step 5) refines and finalizes dates and costs for all components of the system so everything is integrated. Some of the factors considered and established at this time: Ground support, personnel, maintenance, supply, other facilities.

Step 6 is the selection of the contractors. A joint board including the using command (SAC, for example), is set up. The capabilities of known AF contractors are studied, and some are invited to bid.

One Manager or Several?

At this point in the scheme, the AF may appoint one weapon system manager to handle all contracting. It may appoint several contractors, each of whom is responsible for a component (propulsion, guidance, airframe, and nose cone, in the case of a missile). Or it could choose to handle much of the management more directly, either through it own commands or through special management contractors like Rand Corp. or Space Technology Laboratories.

Maj. Gen. Beverly H. Warren, commander of the Air Materiel Command's Aeronautical Systems Center, noted last week that the AF has no rigid rules for choosing a contracting system.

He foresees more use of organizations which are extensions of the AF rather than a contractor.

He hints at more projects like the Dyna-Soar where the AF will itself manage the component systems and the contractors. The electronics of a system, for example, might be managed directly by the AF with several firms linked contractually to meet the requirements.

He suggests, finally, that the AF needs to increase its own capabilities to manage programs. In other words, to take some of the responsibility away from the prime contractors. If this proves true, then AF doors may open a little wider to more firms.

The AF weapon system has been criticized because it left so many decisions up to primes, who might choose their favorite subcontractors. Now the AF appears to be moving slowly toward the Army-Navy system of contracting.

CINCINNATI

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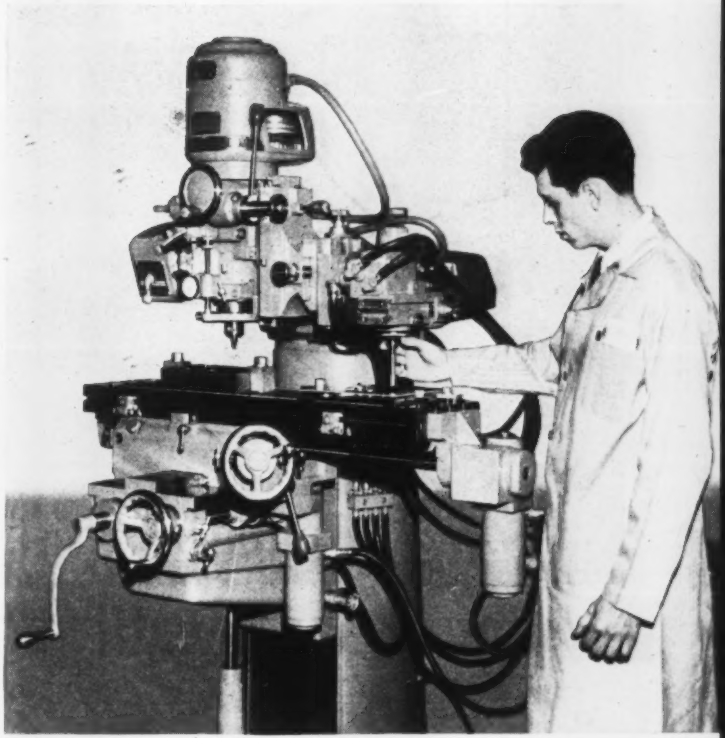
ONE HAND GUIDES 3-DIMENSIONAL MILLING

on CINCINNATI Contourmaster

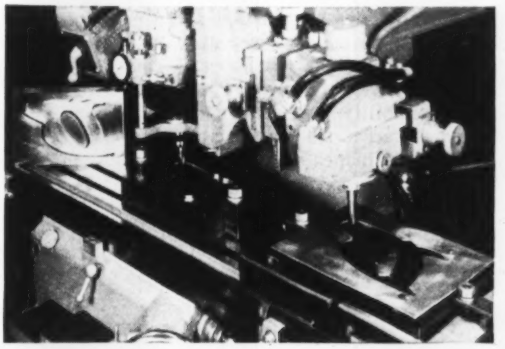
Ask any tool and die maker. Manual control still is highly desirable for roughing out die and mold cavities. There are several ways to perform this type of operation, but the quickest and easiest is on a CINCINNATI No. 1C Contourmaster Milling Machine with its single manual control . . . the 3D hand guided hydraulic tracing unit. This amazingly responsive mechanism directs the table to move right or left; the saddle to traverse in or out; and the cutter spindle to go up or down. All these feed movements are controlled through simple deflection of the tracing finger, as shown in the illustration at right. For conventional toolroom milling, the tracing unit can be quickly disengaged and feed control handwheels employed.

Check into the many advantages of CINCINNATI Contourmasters for your tool and die shop. Complete information on Style 1C will be found in catalog No. M-2008; Styles 1A and 1B, catalog No. M-1919-2.

The Cincinnati Milling Machine Co.
Cincinnati 9, Ohio



THREE-DIMENSIONAL MILLING. Longitudinal, cross and vertical (quill) feed movements are activated through deflection of the tracing finger on the Hand Guided Hydraulic Tracing Unit, a standard feature of CINCINNATI No. 1C Contourmaster Milling Machines. 22″ table traverse; 10″ cross traverse; 42″ x 10″ table working surface. Catalog No. M-2008.



PLASTIC SAW HANDLE MOLD, a typical job for the 3D feature-advantage of CINCINNATI No. 1C Contourmaster. Note the variety of curves in the long outline of the master template (right), and the increase in depth from front to back of the handle.

KNEE TYPE AND BED TYPE MILLING MACHINES • DIE SINKING MACHINES
• CUTTER AND TOOL GRINDERS • ELECTRICAL DISCHARGE MACHINES

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M&T's chromate dip finishes protect and beautify at nominal cost

REDS, GREENS, BLUES, GOLDS – these lustrous metallic colors for zinc-plated products join the line of UNICHROME CHROMATE DIPS which also includes chromium-like clear, jet black, and iridescent yellow finishes.

The new dyed chromate finishes are especially suitable for appliance parts, toys and similar items . . . where the eye appeal of a striking metallic tint adds potent sales appeal. Wire objects in particular take on new beauty and at low unit cost. Enthusiastic users of Unichrome Dips have found that their material costs for chromate treating are only a small fraction of a cent per square foot of surface treated.

Along with color goes a high degree of corrosion resistance – the highest among dyed chromate finishes. In salt spray tests, Unichrome Dip Finishes have prevented appearance of white corrosion for as much as 100 hours. A clear lacquer top coat gives a combination finish with excellent wearability . . . as proved by over a dozen years of successful commercial use of clear Unichrome Dip finishes on refrigerator shelves and builders' hardware.

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Plumbing Fixtures: Sales Dip Due

PLUMBING FIXTURE sales this year should hit nearly $360 million, just short of 1955's record $363 million.

Housing starts, expected to top 1.35 million by yearend, provided most of the impetus. They are also the major factor in 1960's outlook: Housing forecasts call for a slide to 1.2 million starts, so the plumbing fixture industry looks for its sales to drop to about $330 million.

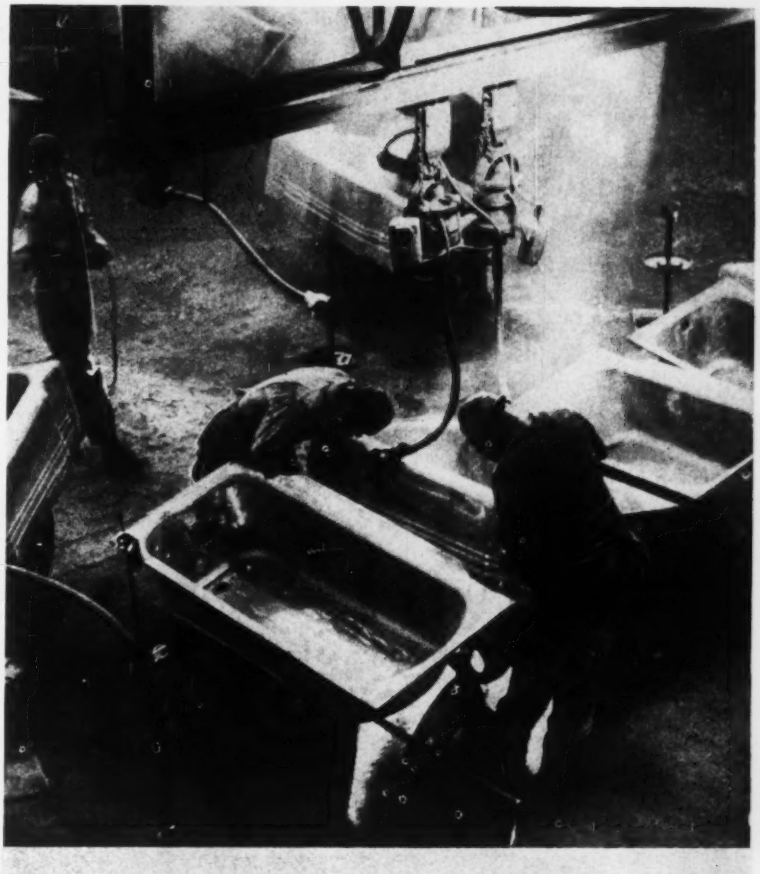
Key elements of strength for next year will be industrial and commercial construction, say officials at Crane Co. and James B. Clow & Sons Inc.

The Plumbing Fixture Manufacturers Association breaks down sales this way:

1. Vitreous china items account for 40 to 42 per cent of the industry's volume.
2. Cast iron products represent 36 to 38 per cent.
3. Formed steel accounts for about 20 to 22 per cent.

Bathtubs are the major products in cast iron and formed steel. The association estimates that about 2.25 million will be sold this year. Next in volume comes lavatories, and formed enameled steel and stainless producers are getting an increasing proportion of the business.

- **Plus Factors**—"A plus influence for the business outlook next year," says Joseph J. Decker, president, Plumbing & Heating Div., American Radiator & Standard Sanitary Corp., "is the trend toward multiple baths, powderrooms, and more lavatories per bathroom." This is not only a factor in new housing, but in the remodeling and replacement market. Industry executives estimate that 60 to 70 per cent of sales flow into new construction. The remainder is split among remodeling, commercial, industrial, and institutional construction.



Sales Curve Follows Housing Starts

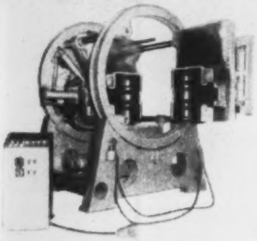
	1955	1957	1959*	1960*
Housing Starts	**1,328,900**	**1,041,900**	**1,350,000**	**1,200,000**
Plumbing Fixture Sales (millions)	**$363**	**$303**	**$360**	**$330**

*Estimated by STEEL. Sources for other years: Bureau of Labor Statistics (housing), Bureau of the Census (fixtures).

The industry is relying on new designs and color to help spur sales. Wall-hung residential water closets, one-piece closets, built-in counter tops and multiple lavatories, and compartment bathrooms are examples of their efforts. There's also an upgrading of fixture quality which may help maintain dollar volume even though unit sales may dip.

These are factors which make some manufacturers more optimistic about 1960. Stanley S. Backner, vice president, Universal - Rundle Corp., doesn't anticipate any significant sales drop. G. S. Blome, vice president, Enamel Products Co., is forecasting a 10 per cent increase for his firm's product line.

Lively competition in the plumbing fixture industry and considerable excess production capacity have tended to suppress prices. The industry, however, introduced price boosts of about 5 per cent in mid-November to counter increases in materials and labor costs.



The Shalco Corporation, pioneers in Shell Core Blowers and Shell Molding Machines, joins forces and becomes a Division of the National Acme Company, pioneers in automatic multiple-spindle bar and chucking machines

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To The Foundry Industry:

Our "Zone of Responsibility" to the metalworking industry is constantly being broadened to include almost every production step from raw material to the finished product. In joining forces with National Acme, Shalco's exclusive developments and broad experience in the art of shell molding is combined with 75 years' experience in automatic machine tool manufacturing and servicing. The result is shell molding equipment built to the highest standards of machine tool precision and reliability.

Shalco's unique design and manufacturing techniques have resulted in low cost, greatly simplified Shell Core Blowers and Shell Molding Machines with unusual flexibility. We believe this outstanding equipment will now allow the Foundry Industry to take greater advantage of the economy, precision and high quality realized with shell molded castings.

One of the most complete engineering and application services in the industry is available to assist foundrymen everywhere in obtaining optimum results from this outstanding process.

President
The National Acme Company

AUTOMATIC BAR AND CHUCKING MACHINES/THREAD CUTTING HEADS/THREAD ROLLING HEADS AND MACHINES/LIMIT SWITCHES/SOLENOIDS/PUSHBUTTON CONTROL STATION SWITCHES/CONTRACT MANUFACTURING/SHELL CORE BLOWERS AND SHELL MOLDING MACHINES/SAND COATING EQUIPMENT/CORE BOXES/RELATED FOUNDRY SUPPLIES

National Acme

AMCHEM Information Bulletin

A REVIEW OF PHOSPHATE COATINGS

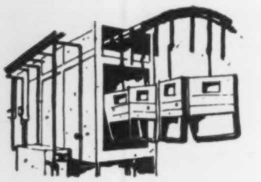
Specified for the Protection of Metal Surfaces

By HUGH GEHMAN, Assistant Manager, Product Development Dept., AMCHEM PRODUCTS, INC.

Phosphate coatings are protective inorganic finishes that actually change the chemical nature of metal surfaces. The metal reacts with the applied phosphate solution to form a nonmetallic, crystalline coating which serves to:

- **Improve paint adhesion**
- **Provide protection against corrosion**
- **Increase lubricity of friction surfaces**
- **Facilitate mechanical deformation of metals**
- **Decorate—in many instances**

Satisfactory protection of steel, zinc and aluminum surfaces against corrosion, paint peeling and blistering, and hard wear requires precision methods of chemical conversion coating.



Typical automotive spray installation.

Types of Conversion Coatings

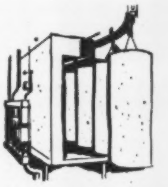
There are seven classes of chemical conversion coatings commonly specified and used throughout industry today. They are as follows:

Zinc-iron phosphate (Amchem Granodine). This is the heaviest type of coating (gray in color) used for prepaint treatments on steel, iron and zinc surfaces. The process requires five or six operations: cleaning; rinsing; rust removal, if necessary; coating; rinsing; and a second rinse. Coating weight ranges from 100 to 600 mg per sq. ft.

Medium or large volume production of automobile bodies, appliances, projectiles and cabinets can be handled effectively.

The coating solution improves paint adhesion by forming a crystalline deposit over the metal surface. This deposit is rough, as revealed microscopically, and so offers an ideal gripping surface for paint particles.

Manganese-iron phosphate (Amchem Thermoil-Granodine). This is a heavy black coating used on friction surfaces to prevent galling, scoring and seizing of parts. Typical metal parts treated are pistons, piston rings, gears, cylinder liners, camshafts, tappets and various small arms components.



Typical appliance treatment line.

Iron phosphate (Amchem Duridine). This is a comparatively new process that places a light coating on surfaces for improved paint adhesion. Since cleaning and coating occur in the same bath, it has only three to five stages.

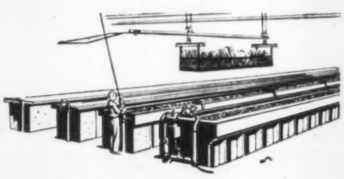
The iron phosphate treatment is a spray process suited for medium to large volume, large or small work. Precleaning is normally unnecessary, an economy factor in its favor.

Products protected by this process are steel or iron fabricated units, such as cabinets, washing machines and refrigerators. Weight of coating is 50 to 100 mg per sq. ft.

Zinc phosphate (Amchem Lithoform). This is a crystalline coating produced on galvanized iron and other zinc surfaces—also cadmium—for improving paint adhesion. The purpose of the coating is to provide a paint-gripping surface and to prevent the reaction between acidic components of the paint and the zinc metal, with the formation of soaps and loss of paint adhesion.

This coating is applied in weights of 75 to 500 mg per sq. ft. There are no limitations on volume or production or on size of products treated. Zinc phosphate coating is used on zinc alloy die castings, zinc or cadmium plated sheet or components, hot dip galvanized stock, and Galvanneal.

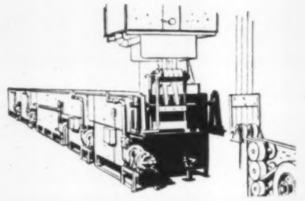
Amorphous phosphate (Amchem Alodine). This a protective coating for aluminum and aluminum alloys. It may be used in place of anodic deposition for improved paint adhesion and corrosion resistance.



Typical aircraft dip installation.

This coating is practical for production in any volume. Coating weight is 100 to 600 mg per sq. ft. Products treated include aluminum awnings, doors and windows, aircraft and aircraft parts, missile parts, roofing and siding. Particularly good when aluminum is painted prior to forming.

Zinc-iron phosphate for oil absorption (Amchem Permadine). This is a relatively heavy coating adapted to the retention of rust-inhibiting drying or nondrying oils and waxes on ferrous metal surfaces. The coating is applied to a weight of 1000 to 4000 mg per sq. ft.



Typical continuous strip line installation.

The process is satisfactory for large or small work in any volume—nuts, bolts, hardware, guns, tools, etc.

Zinc-iron phosphate for metal forming (Amchem Granodraw). This is a specialized coating used in conjunction with a suitable lubricant to facilitate the cold mechanical deformation of steel. The coating acts as an anchor for the lubricant throughout drawing, extrusion, and cold forming operations.

It is a successful treatment for products such as blanks and shells for cold forming, heavy stampings, impact extruded shapes, drawn wire and tube.

For more complete information about any one or all of these chemical conversion coatings, contact an Amchem sales representative or write us at Ambler 27, Pa.

AMCHEM PRODUCTS, INC. (Formerly American Chemical Paint Co.)

AMBLER 27, PA. • Detroit, Mich., St. Joseph, Mo., Niles, Calif., Windsor, Ont

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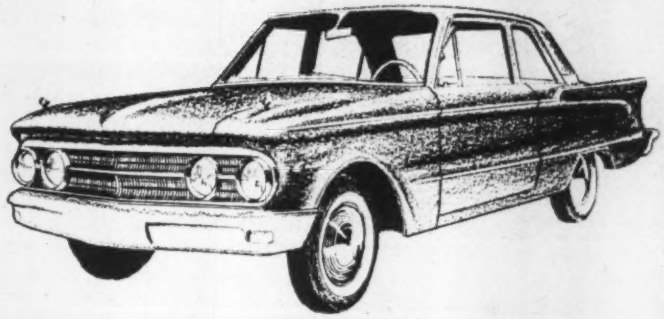
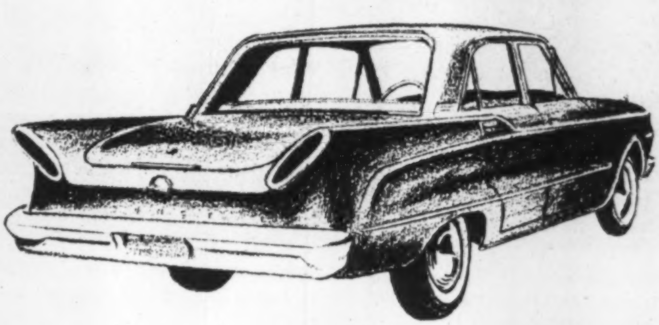


TWO DOOR SEDAN



FOUR DOOR SEDAN

An artist's sketch of Ford's Comet spurs talk on . . .

How '61 Models Shape Up

TOOLING DEADLINES are early for many 1961 models which makes Detroit believe the industry is trying for August-September introductions. Major dies have been out for several months and most of the final tooling is being released.

Suppliers say next year will see one of General Motors' biggest changes. Chrysler plans an aluminum engine. So does AMC. Ford is doubling up on body shells for Mercury and the Ford car.

As Steel reported last week (p. 111), Fisher Body Div. has ordered $5 million worth of presses which eventually will find their way into at least three stamping lines for small vehicle parts. Another $15 million in supplemental tooling will be needed to back up the initial expenditure. The corporation also is installing a new engine line at Buick Div. and is modifying at least one transmission line for 1961.

• **GM Takes Two**—There's little doubt now that GM is back with two body shells plus an extension for its larger cars. A third shell is being tooled for the Buick-Oldsmobile-Pontiac (B-O-P) small car. As has been the case with a single shell, many of the body components will be interchangeable, but suppliers claim that each division will be sporting distinctly different quarter panels for 1961.

The long awaited Trans-axle will be out next year. One job already has been released for Cadillac and Oldsmobile. A second version is expected to go out for production tooling shortly. It appears to be slated for Pontiac.

Informants say the aluminum engine line at Buick has been designed so the division can switch back to cast iron blocks if the aluminum jobs don't pan out.

GM reportedly is considering moving away from high silicon aluminum because it has presented more machining problems than anticipated. This line initially will turn out blocks for the B-O-P small car.

• **More Aluminum** — Oldsmobile and the B-O-P small car both will get diecast aluminum dashboards next year, reports one supplier who has seen quotes on the jobs.

The aluminum industry has made little secret of the fact that aluminum bumpers are on the way. Motordom is guessing which GM divisions will sport them. Pontiac and Chevrolet look like best bets. Chevrolet has built dies to check out production feasibility, says one engineer. Hot formed bumpers appear to be most promising. The process consists of heating an extruded bumper shape to 850 or 900° F and hot forming it with cam dies. Die trimming, buffing, bright dipping, and anodizing follow. Costs are approximately 50

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cents less per unit than present steel stamped jobs.

I BEAT-THE-EXPERTS

These Car Keys . . .

. . . (And the car to go with them) could be yours for two weeks. Flip back to the Servicenter, Page 5, for details of our Beat-the-Experts contest. Then send in your entry.

• **Ford Pushes Comet**—Although it doesn't fall directly in the 1961 model program, Ford's Comet will be the next new car on the market. Originally scheduled for April or May introduction, Comet has been pushed ahead, reportedly to late February. The Falcon engine will be unchanged in displacement for Comet use, but a special performance package will mean higher advertised horsepower for the larger compact car.

Other Ford lines will be undergoing fairly conventional skin changes.

• **Advanced Planning**—It appears that Ford has several interesting developments underway. One is a radically different "C" engine which could be an aluminum V-4 with about 110 cu in. displacement. It is an adaptation of the old "Scotch Yoke" design with no cam shaft, but double headed pistons.

More likely are reports that Ford hopes to have a front wheel drive car on the market in the next few years. That will mean a major revision of undercarriage components, including brakes, suspension, and driveshafts. It also could put Ford in the market for a front end transmission-differential combination.

Ford's front wheel drive thinking reportedly is one of the reasons for the recent purchase of Gear Grinding Machine Co., Toledo, Ohio, by Dana Corp. Gear Grinding has the manufacturing rights to the Rzeppa universal joint and the story is that Dana expects to have four of the joints on a Ford car by 1963. STEEL sources claim the Rzeppa joint is preferred over the Bendix and conventional hook type joints for this type of drive. It's believed Dana can turn out the Rzeppa joint for no more than the Bendix job costs. The government also is a good customer for this joint in Jeep vehicles and (in a larger version) for aircraft.

Two other Ford programs are the much discussed central hydraulic system and pedalless car. Recent development of a small, low cost accumulator is bringing the central hydraulic system closer to production for other carbuilders as well as Ford, but finding a versatile fluid still poses a problem. It's not expected before 1962.

The pedalless car, which is "way out" in Ford planning, actually consists of near flush accelerator and brake pedals which are covered by the floor mat and appear as two small "humps" on the floor.

• **Chrysler Stands Pat**—The Forward Look firm made its big change in this year's models when it introduced a new engine and unit bodies. Facelifts are planned for '61. There's no sign of the complete restyling which many members of motordom have been expecting. The wedge shaped silhouette will be continued. Look for some changes in Plymouth to bring its appearance more in keeping with Valiant's style line.

Chrysler's aluminum engine seems to be hot, perhaps ready for the 1961 model run. Tooling has been released for a permanent molded aluminum head. Doehler-Jarvis Div., National Lead Co., Toledo, Ohio, reputedly has done the designwork on the block, but production is expected to be handled in 1600 ton diecasting machines at Chrysler's Kokomo, Ind., plant.

• **AMC Gets Light Engine**—American Motors Corp. plans to continue what George Romney, president, calls "sensible styling." It will modify present Rambler body shells for 104 in. and 112 in. wheelbase. It will introduce a convertible model to compete with the Lark ragtop.

Doehler-Jarvis is in the aluminum engine act at AMC too. The story is that the Toledo firm has designed and will produce a diecast aluminum block with centrifugally cast steel liners in the cylinder bores.

From overseas, it's reported that AMC's British built Metropolitan will be completely restyled for the 1961 season. The changes supposedly include a new body and skin as well as a lightweight, more efficient engine. This could be where AMC plans its aluminum engine breakthrough. Several people interested in the development believe AMC will watch the pint size car's performance in the '61 market before deciding whether it should give larger Ramblers a similar treatment. If so, it means the larger lines won't get a major change until 1963.

• **S-P Waits** — Studebaker-Packard Corp. will preserve the basic Lark style line. It plans some minor skin changes, new grilles, and trim alterations. Look for more emphasis to be placed on a revitalized Hawk line in 1961. It's understood that S-P is searching for a lightweight engine and a better braking system, but there are no visible orders out for those components.

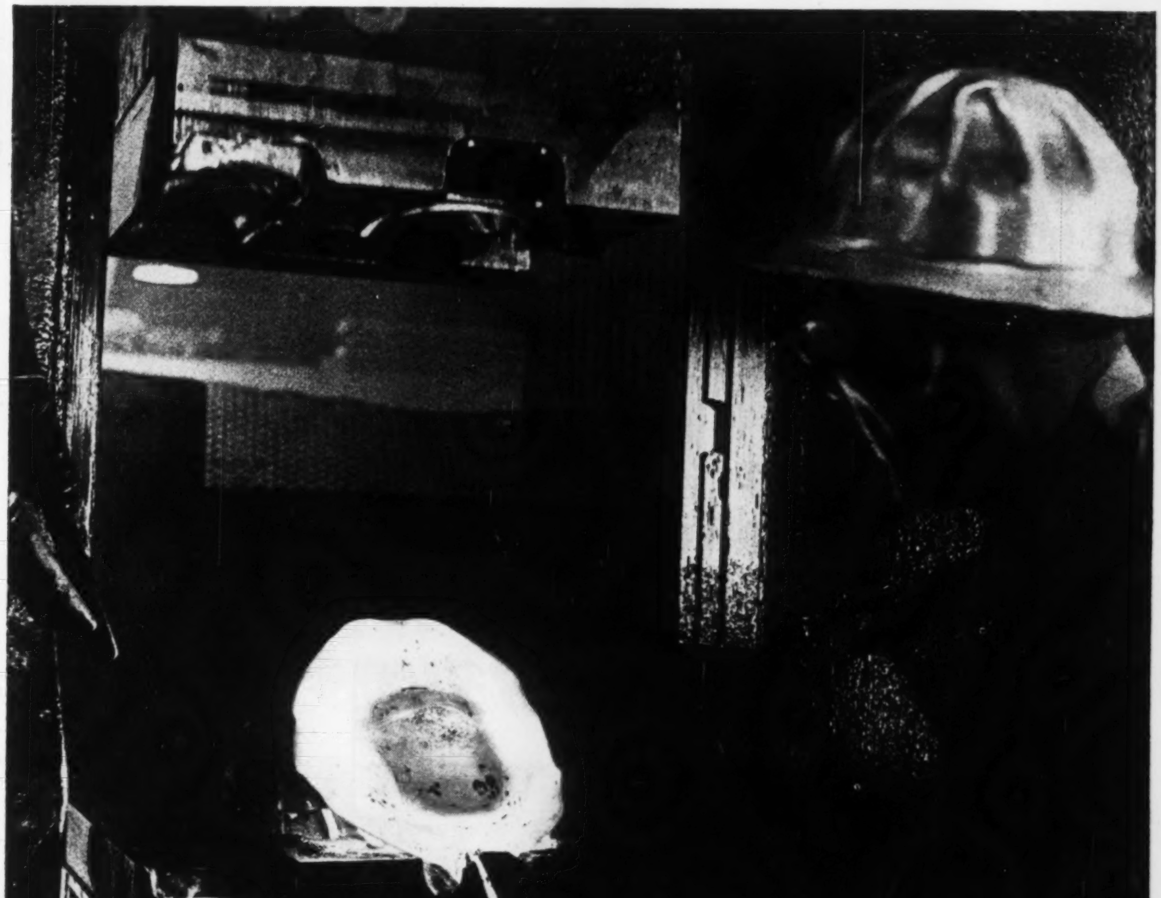
U. S. Auto Output

Passenger Only

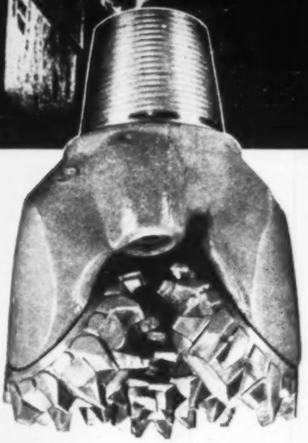
	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
August	239,152	180,447
September	258,157	130,460
October	507,530	261,701
November	254,518	514,152
11 Mo. Totals	5,098,737	3,650,125
December	......	593,920
Total	......	4,244,045

Week Ended	1959	1958
Nov. 7	63,451	125,279
Nov. 14	64,230	117,688
Nov. 21	68,476	138,727
Nov. 28	46,740	123,008
Dec. 5	54,369†	147,361
Dec. 12	70,000*	137,882

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.



Photograph courtesy of Pacific Forge, Inc., Fontana, Calif.



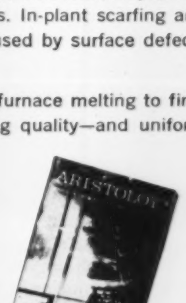
Of course Pacific Forge is fussy about surface condition

On drill bits for Security Engineering Division, Dresser Operations, Inc., Aristoloy round-cornered squares meet this forger's stringent requirements. In-plant scarfing and grinding prior to forging have been eliminated—rejects caused by surface defects have been reduced to a minimum.

The secret—careful control of Aristoloy Steels from electric furnace melting to final rolling operations. The result—alloy steels of prime forging quality—and uniform chemical, structural, and hardenability characteristics that satisfy the critical use requirements for rock drill bits.

For complete information about Aristoloy structural alloy, stainless and carbon steels in leaded or standard analyses, contact the local Copperweld representative in your nearest large city. Or write for complete information.

ARISTOLOY
STEELS



COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4005 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

Change in nut saves $11,000

RB&W survey shows business machine maker how simple change in fastener dimensions will add to profits the equivalent of $110,000 in extra sales

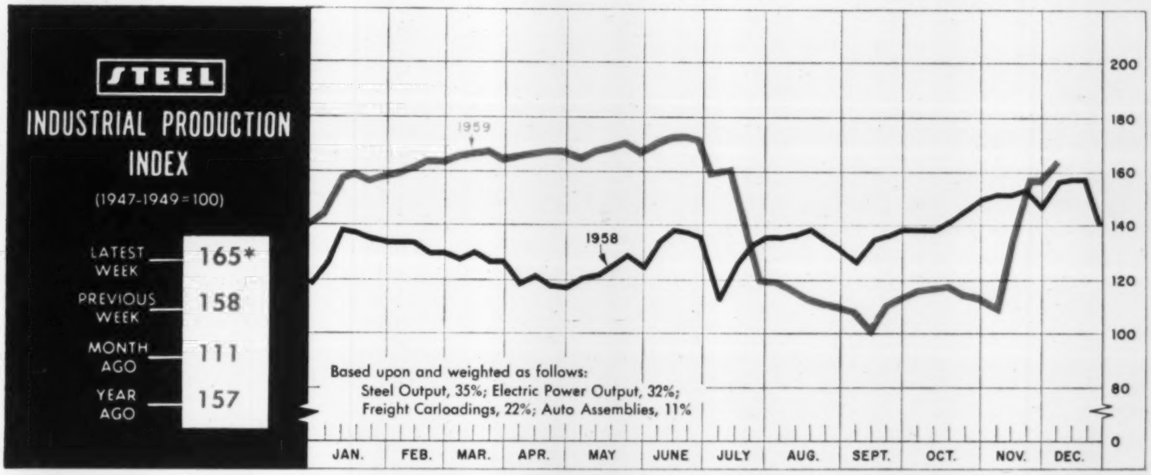
A simple change in nut size offered one typewriter manufacturer an $11,000 a year saving. Yet it involved no re-engineering . . . no compromise with quality.

The RB&W Fastener Man was invited to make a survey of the manufacturer's fastener usage. In studies of blueprints and specifications, he found only one minor area for improvement—but what an improvement! The drawings still showed a hex nut taken from specifications long obsolete as a standard. By simply switching to the current standard size, the manufacturer could save $11,000. That's pure profit. Even if his net-on-sales were as high as 10 per cent. It would take *extra* typewriter sales of $110,000 to net the same amount.

Are you sure you're not wasting needless dollars on fastener specifications? Why not ask for an RB&W man to make a survey of your fastening operations. He's no smarter than your engineers, but he knows what to look for. Write Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

RB&W
115th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.



*Week ended Dec. 5.

1959 Record Year Despite Strike

RISING TRENDS characterize the economy as 1959 near its end. When the final report is written, it will show that this was the greatest year, over-all, in the nation's history despite some lingering effects of the 1957-58 recession and the longest steel industry strike.

One of the most dramatic upsurges is seen in STEEL's industrial production index above. Less than a month after the steelworkers returned to work, the trend line climbed to within 9 points of the all-time record set last May. At a preliminary 165 (1947-49 = 100) for the week ended Dec. 5, it was 3 points above the level immediately preceding the strike in July and 54 points above the strike low point in the first week of November.

- **Steel Record**—The uptrend is being spurred by steel production, which set an all-time peak in the week ended Dec. 13. Producers scheduled output at 95 per cent of capacity, good for 2,690,000 net tons of steel for ingots and castings. The previous high was 2,657,000 tons in the Apr. 19 week this year.

But steel is not the only force behind the rise. Production of electricity is within sight of its previous crest of 14.1 billion kw-hr a week. With strong demands from all major customer groups—industry, commerce, and residential — it should break through to new ground this month. Only slightly less important is the weekly increase in railroad freight carloadings. While they may not regain the level of 700,000 or more cars a week common before the steel strike, they will remain relatively strong as producers rush to fill pipelines emptied by the long walkout.

The only weak spot in the composition of the index is auto production. And even here, producers are scheduling their comeback with a goal of 453,200 cars in December vs. only 254,518 last month.

- **New Peak Ahead**—All of which

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,690[1]	2,650	1,985
Electric Power Distributed (million kw-hr)	13,900[1]	13,173	13,017
Bituminous Coal Output (1,000 tons)	8,055[1]	9,425	7,766
Crude Oil Production (daily avg—1,000 bbl)	7,100[1]	6,969	7,067
Construction Volume (*ENR*—millions)	$383.4	$389.8	$399.1
Auto, Truck Output, U. S., Canada (*Ward's*)	70,021[1]	60,042	179,872
TRADE			
Freight Carloadings (1,000 Cars)	635[1]	574	594
Business Failures (Dun & Bradstreet)	268	287	244
Currency in Circulation (millions)[3]	$32,444	$32,269	$32,057
Dept. Store Sales (changes from year ago)[3]	+3%	+8%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,932	$26,056	$21,835
Federal Gross Debt (billions)	$290.6	$290.5	$282.8
Bond Volume, NYSE (millions)	$37.4	$26.0	$31.9
Stocks Sales, NYSE (thousands of shares)	18,033	13,699	17,565
Loans and Investments (billions)[4]	$104.2	$104.3	$95.2
U. S. Govt. Obligations Held (billions)[4]	$27.2	$27.5	$32.5
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	247.82
STEEL's Nonferrous Metal Price Index[6]	231.2	231.7	217.5
All Commodities[7]	119.0[1]	119.0	119.0
Commodities Other than Farm & Foods[7]	128.7[1]	128.7	127.0

*Dates on request. [1] Preliminary. [2] Weekly capacities, net tons: 1959, 2.831.486; 1958, 2,699,173. [3] Federal Reserve Board. [4] Member banks, Federal Reserve System. [5] 1935-39=100. [6] 1936-39=100. [7] Bureau of Labor Statistics Index, 1947-49=100.

WHAT'S
DIFFERENT
ABOUT
BRMCO

At BRMCO, each order receives the careful, individual attention that ensures quality and uniformity. And, no order is considered complete until the customer has used every pound of BRMCO brass, bronze or aluminum to his utmost satisfaction.

Whatever the requirements, BRMCO specializes in providing metals – in strip or rolls – to meet the most exacting specifications. In fact, BRMCO excels in maintaining tight tolerances on temper, grain size, and dimensional requirements.

BRMCO also provides metallurgical assistance, specific date delivery, and special packaging and shipping arrangements to accommodate your handling equipment.

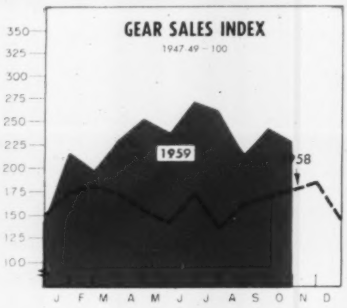
See for yourself the greater efficiency and lower metal working costs that BRMCO makes possible.

We'll be happy to send you samples for your own testing and analysis. Simply write, or call collect.

BRMCO

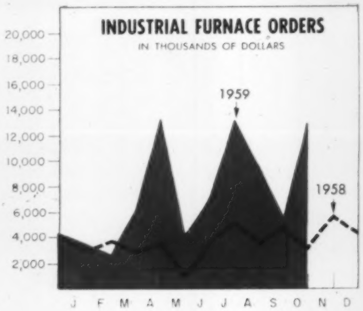
Bridgeport Rolling Mills Company
BRIDGEPORT, CONNECTICUT
Subsidiary of Atlantic Coast Industries, Inc.
FINE QUALITY ALUMINUM, BRASS
AND BRONZE IN STRIP AND ROLLS

THE BUSINESS TREND



	1959	1958	1957	1956
Jan. ...	218.6	174.5	259.3	245.5
Feb. ...	199.9	179.1	239.5	256.2
Mar. ...	234.3	173.7	262.4	276.5
Apr. ...	255.6	153.2	221.7	264.7
May ...	241.0	142.2	263.2	275.6
June ...	274.2	173.8	215.9	245.4
July ...	262.8	133.3	211.4	286.7
Aug. ...	213.3	162.1	225.8	219.5
Sept. ..	243.9	170.7	174.9	230.5
Oct. ...	230.5	175.9	207.0	299.8
Nov. ...	....	182.7	165.3	216.2
Dec. ...	....	145.5	150.8	235.7
Avg ...	....	163.9	216.4	254.4

American Gear Mfrs. Assn.
Charts copyright, 1959, STEEL.



	1959	1958	1957
Jan.	3,518	3,047	8,775
Feb.	2,741	3,684	9,769
Mar.	6,146	2,871	10,485
Apr.	13,328	3,572	4,559
May	4,174	954	5,389
June	7,029	3,672	4,369
July	13,141	5,169	4,332
Aug.	9,738	3,533	3,924
Sept.	5,560	4,846	7,463
Oct.	12,967	3,105	3,674
Nov.	....	5,597	2,832
Dec.	....	4,284	3,992

Industrial Heating Equipment Assn. Inc.

means the index is due for a record performance this month. Best guess for timing: The week ending Dec. 20. Best guess for the new mark: 176 per cent of the 1947-49 base.

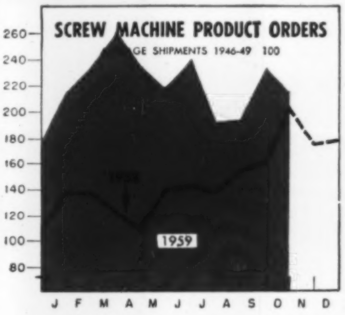
Pace Setters Numerous

While other indicators may not show such a sharp rise (they are dependent to a lesser degree on the steel industry), they will still mark 1959 as the year to beat. Here are a few which will set records.

- **Gross National Product**—It will rise to a little over $480.3 billion compared with the previous high of $442.5 billion in 1957.
- **FRB Index**—This broad barometer of production will average 150 (1947-49) for the year compared with 143 in both 1956 and 1957.
- **National Income** — The high point of $366.5 billion set in 1957 will be topped by this year's $400.8 billion.
- **Metalworking** — Sales by this largest of all industries will reach $145 billion this year, about $3.8 billion above the 1957 pinnacle.
- **Manufacturers' Sales**—The total will climb to $357 billion against 1957's $340.6 billion. Sales of durables will top the 1957 record of $170.2 billion by about $5.3 billion.
- **Business Community**—New incorporations are running at a surprising rate of 16,360 a month this year, far above the previous high of 12,565 last year. Combined with a downtrend in business failures this year, this puts the total business community at an all-time best of 4,666,000 firms.
- **Electricity**—The nation's electric utilities will turn out close to 688 billion kw-hr of power this year, 6.7 per cent better than in 1958.
- **Construction**—One of the biggest increases will be in construction, which will reach $54 billion this year, 10 per cent ahead of last year's pace. Though housing has been declining during the last half year or so, it will come close to a record with 1,325,000 new starts. The record was 1,396,000 in 1950.
- **Warm Air Furnaces**—This industry will ship 1,450,000 units this year, smashing the old mark of 1,406,144 established in 1955.

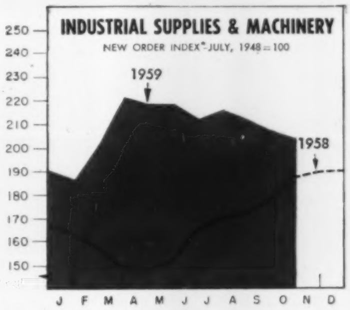
So Are Near Misses

Not all segments of the economy will break records in 1959. Some



	New Orders 1959	New Orders 1958	Shipments 1959	Shipments 1958
Jan.	215	138	193	165
Feb.	236	137	193	145
Mar.	260	122	214	141
Apr.	234	108	219	141
May	219	139	201	134
June	239	142	218	133
July	192	138	194	124
Aug.	194	154	205	142
Sept.	233	161	216	151
Oct.	214*	203	228*	184
Nov.	...	176	...	158
Dec.	...	179	...	175
Avg	...	150	...	149

*Preliminary.
National Screw Machine Products Assn.



	1959	1958	1957	1956
Jan.	186	163	221	190
Feb.	202	157	219	190
Mar.	221	149	210	190
Apr.	218	148	203	195
May	218	152	199	199
June	212	164	199	197
July	216	170	197	203
Aug.	212	172	197	211
Sept.	207	178	203	203
Oct.	204	187	192	206
Nov.	...	189	180	220
Dec.	...	190	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

got too late a start after the recession to accomplish the feat this year, but many are ending 1959 on an uptrend which may carry them to new peaks in 1960. Here is how some of them will fare for the year as a whole:

- **Steel**—Production will reach at least 92.5 million ingot tons despite the three-month layoff.
- **Foundries** — Producers of gray iron castings will almost equal their last "good" year of 12.7 million tons in 1957. Steel founders will ship about 1,350,000 tons of castings compared with 1,766,191 two years ago. They had planned on about 1.5 million tons before the strike interferred.
- **Canmakers**—Shipments of metal cans containing about 4,725,000 tons of steel will come close to the 1957 standard when 4,786,000 tons were consumed.
- **Plant and Equipment** — The strong uptrend in the last half of the year will carry this important business barometer to about $33.3 billion (Securities & Exchange Commission's series). While it will be significantly short of the high mark of almost $37 billion in 1957, the trend portends a breakthrough during the coming year.
- **Employment**—Average total employment this year will be about 63,880,000 persons, making it the fourth best year in history.
- **Machine Tools**—Even though it ends the year on an uptrend, this industry will do well to match 1958's shipments of $410 million.
- **Material Handling**—Producers of this equipment are having a good year, with orders averaging about 135 per cent of the 1954 base period. Last year, the average was only 109 per cent.
- **Gears**—New orders for this component are averaging 237 per cent of the 1947-49 base, only slightly below the top average of 254 in 1956. (See graph and table Page 80.)
- **Appliances** — Producers of most major white goods are having the best year since 1955 or 1956. Output of radios this year will total about 17.1 million sets, second only to the banner year of 1947 when 20 million sets were made.
- **Autos**—This industry, hampered badly by the steel strike, will show a substantial recovery from the recession with assemblage of close to 5.5 million cars and 1.1 million trucks.

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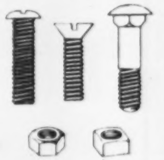

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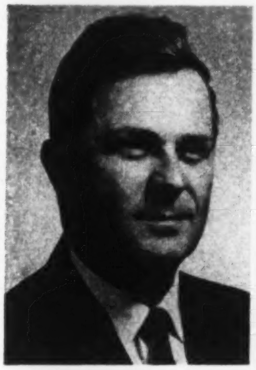

DONALD L. SCHMITT
Lockhart Iron & Steel post

FRANCIS P. IAPALUCCI
Lake Erie Machinery mgr.

EDWARD A. GILMORE
Youngstown Sheet & Tube supt.

ROBERT E. LAUTERBACH
Pittsburgh Steel v. p.

Donald L. Schmitt was appointed sales manager, Aluminum Div., **Lockhart Iron & Steel Co.**, McKees Rocks, Pa. He was welding engineer with Sciaky Bros. Inc.

Francis P. Iapalucci was made plant manager, **Lake Erie Machinery Corp.**, Buffalo, subsidiary of Wheelabrator Corp. He has served in engineering, manufacturing, and sales with Ford Motor Co., Baldwin-Lima - Hamilton Corp., Jackson Products, and Chrysler Corp. He is vice chairman of the Filler Metals Committee of ASTM and AWS, and is industrial co-ordinator of the main Advisory Committee for Ordnance.

Donald E. Rice was appointed vice president - operations, **Columbia-Geneva Steel Div.**, United States Steel Corp., San Francisco. He was general manager-operations.

A. G. Neese was made general sales manager, **Sharon Steel Corp.**, Sharon, Pa. He was assistant general sales manager.

Ingersoll-Rand Co. elected **W. T. Alderson** vice president. Previously manager, Compressor Engineering Dept., he is now in the executive offices in New York.

John G. White was named assistant general sales manager, Pacific Coast Div., **Bethlehem Steel Co.**, San Francisco.

Robert A. Pitcairn was appointed manager of marketing research by **Crucible Steel Co. of America**, Pittsburgh.

Edward A. Gilmore was appointed superintendent of the seamless tube mill at **Youngstown Sheet & Tube Co.'s** Indiana Harbor Works, East Chicago, Ind. He was general superintendent of Mannesmann Tube Co., Sault Ste. Marie, Ont.

C. M. Basile was elected president, **Link-Belt Speeder Corp.**, Cedar Rapids, Iowa, to succeed **D. W. Lehti**, retired. Mr. Basile was executive vice president of the Cedar Rapids plant, and president of Link-Belt Speeder (Canada), Woodstock, Ont.

John A. Prince was elected president, **United Forge Co.**, Detroit, to succeed **Alan C. Prince**, retired. **Herbert G. Henchel** was elected vice president-general manager.

Frederic E. Crist was elected vice president-administration, **Associated Spring Corp.**, Bristol, Conn.

Joseph Carlstein was named chief engineer, **Ketay Dept.**, Commack, N. Y., for Norden Div., United Aircraft Corp.

Paul F. Ziegler was named technical director, **Johnston & Funk Metallurgical Corp.**, Huntsville, Ala.

Dr. Earl J. Serfass was elected vice president-research and development of **Milton Roy Co.**, Philadelphia. He resigns as chairman, Department of Chemistry, Lehigh University. He continues as president of Serfass Corp., Bethlehem, Pa., division of Milton Roy, and will maintain his offices there.

Robert E. Lauterbach was elected vice president-sales, **Pittsburgh Steel Co.**, Pittsburgh. He was vice president-administration and planning. He succeeds **Marvin J. Bair,** named assistant to the executive vice president. He will co-ordinate special corporate problems.

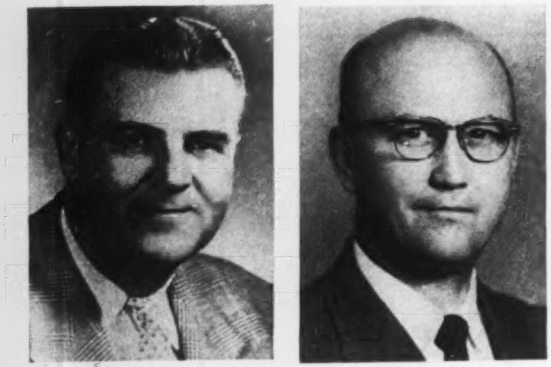
C. R. Eisenschmidt Jr. was elected president of **Amsler Morton Co.,** Pittsburgh, recently acquired by Textron Inc. **E. P. Williams** was made vice president-administration. Mr. Eisenschmidt was manager of the Nuclear Core Dept. with Westinghouse Electric Corp.'s Bettis Atomic Power Div.

Royal Industries Inc., Beverly Hills, Calif., appointed **Harry Houdyshell** chief engineer, **Dean Oleson** assembly superintendent of its Pacific Electronic Controls Div. Mr. Houdyshell was chief product engineer, Helipot Div., Beckman Instruments Inc. Mr. Oleson was factory supervisor of Helipot's Poco Tiempo Dept.

Franklyn J. Millhouse was promoted to Pacific Coast sales manager, Electrode Div., **Great Lakes Carbon Corp.** He is in San Francisco. He was sales representative at the division's Detroit office.

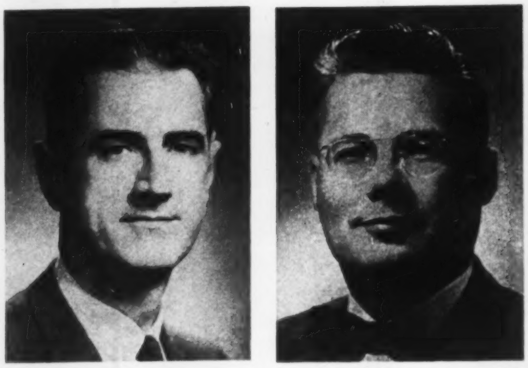
J. Edward Sunkes was made director of purchasing, **United Engineers & Constructors Inc.**, Philadelphia. **Gustave A. Heckscher** was named new business representative.

Ronson Corp., Woodbridge, N. J., elected **John A. Livingston** vice president-sales of its Cerium Metals &



H. M. PATTON K. F. POTTER

American Hoist vice presidents



FRANK M. FIVES WALTER A. SNOW

managers for Elliott-Carrier

Alloys Div., **Ronson Metals Corp.**, a subsidiary.

H. M. Patton, works manager, and **K. F. Potter**, director of engineering, **American Hoist & Derrick Co.**, St. Paul, were elected company vice presidents.

Robert E. Wolff, former sales manager, Tool & Instrument Div., Illinois Tool Works, was named general sales manager of **Van Straaten Chemical Co.**, Chicago.

Leslie J. O'Donoghue heads the new Mobile Produce Service Dept. of **Vickers Inc.**, Detroit, division of Sperry Rand Corp.

Paul W. Beamer fills the new post of manager, new products sales and development, at **Wyman-Gordon Co.**, Worcester, Mass.

Orval W. Riggs was named headquarters sales administration manager by **Republic Flow Meters Co.**, Chicago, subsidiary of Rockwell Mfg. Co.

Francis E. Hummel was made manager of distributor sales and marketing, **Bassick Co.**, Bridgeport, Conn., a division of Stewart-Warner Corp.

Hooker Chemical Corp., Niagara Falls, N. Y., announces expanded executive duties for three vice presidents: **Thomas F. Willers** is responsible for the Eastern Chemical, Phosphorus, and Durez Plastics Divisions, as well as for corporate engineering. **F. Leonard Bryant** is responsible for corporate research, marketing, and general development. **John S. Coey** succeeds Mr. Willers as general manager, Eastern Chemical Div. Also announced: **Robert E. Noble** succeeds Mr. Bryant as general manager, Phosphorus Div.; **Charles Y. Cain** succeeds Mr. Coey as sales manager, Eastern Chemical Div. **James W. Ferguson** succeeds the late **Alfred W. Hanmer** as sales manager, Durez Plastics Div.

Edward J. Finn succeeds the late **W. C. Gram** as central regional manager, Cleveland, for **Chase Brass & Copper Co.,** subsidiary of Kennecott Copper Corp.

Charles R. Holman was made manager for **Pittsburgh Plate Glass Co.**'s Springdale, Pa., paint factory. He succeeds **T. V. Griffin.**

Gordon O. Watson, former assistant director-marketing, midwestern sales district, was promoted to assistant director-marketing for **Carborundum Co.**, Niagara Falls, N. Y.

James Turk was named Midwest district sales manager, **Cleveland Tramrail Div.**, Cleveland Crane & Engineering Co., Wickliffe, Ohio. He succeeds **W. P. Hanks**, retired.

Wayne J. Mitchell succeeds **Lester T. Graham** as district manager at Portland, Oreg., for **Link-Belt Co.** Mr. Graham is retiring.

Robert Bruce Jr. was made marketing manager, Defense Products Div., Syosset, N. Y., **Fairchild Camera & Instrument Corp.** He replaces **Raul H. Frye**, resigned.

Joseph L. Sorensen was made division superintendent-general services, Gary, Ind., Works, **U. S. Steel Corp.**

Frank M. Fives, sales manager, and **Walter A. Snow**, engineering manager, will head the new Industrial Air & Gas Compressor Dept. at **Elliott Co.**, Jeannette, Pa., a division of **Carrier Corp.** Engineering and sales of industrial compressor lines, formerly divided between the Machinery & Systems Div. of Carrier at Syracuse, N. Y., and the Elliott Co., are now consolidated at Jeannette.

Howard A. Schmeal was elected vice president, treasurer-secretary of **Ingersoll Products Div.**, Chicago, Borg-Warner Corp.

Dr. Gurdon M. Butler Jr. was made director of research, **Gladding, McBean & Co.**, Los Angeles.

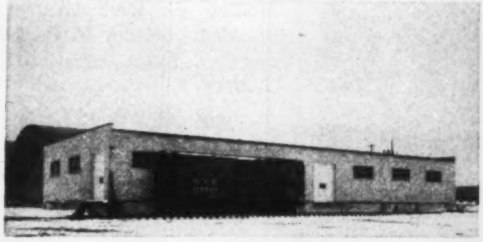
Carleton D. Cole was made regional manager of the Detroit office of **Mid-West Abrasive Co.**

Marshall Dyer was elected vice president, **Trundle Consultants Inc.**, Cleveland. He was assistant to the president.

George F. Quayle, assistant director-engineering, **Yale Materials Handling Div.**, Philadelphia, Yale & Towne Mfg. Co., was placed in charge of new product development. **Richard F. Brackin** succeeds Mr. Quayle.

J. Brandon Shaw was promoted to eastern sales manager with headquarters in the main offices of **Producto Machine Co.**, Bridgeport, Conn. **David S. Hodgson** was made distributor sales manager.

O. G. White was made director of procurement for the Defense Op-



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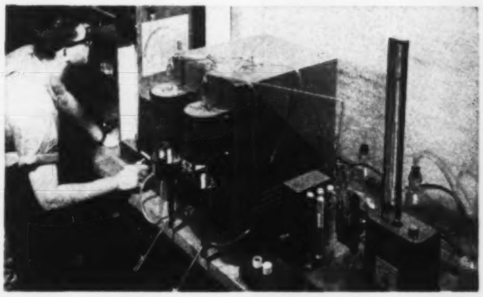

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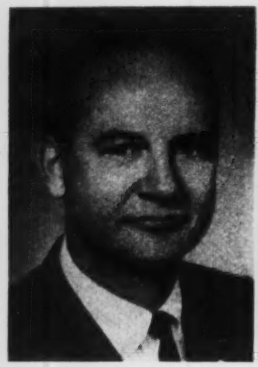

DUDLEY W. ROCKWELL
heads Stanley P. Rockwell Co.

DONALD H. TURK
Production Machinery chief eng.

EUGENE A. COOK JR.
Selas chief engineer

JAMES E. BROWN
AS&W-Chicago operations mgr.

JACK H. SCHRON
Jergens Tool president

HENRY A. TOBEY
Timken div. v. p.-mfg.

erations Div. of **Chrysler Corp.**, Detroit.

James E. Brown was named manager of operations for the Chicago district of **American Steel & Wire Div.**, U. S. Steel Corp. He succeeds **Nelson W. Dempsey**, retired. Mr. Brown was vice president-general manager of the division's Cyclone Fence Dept. In his new post, he supervises all AS&W operations in the Chicago district, including Cyclone Fence.

Clinton Engines Corp., New York, appointed **Jack L. Champion** director-purchasing and production control.

Paul H. Goodell was made chief engineer, Panelbloc Div., **Bettcher Mfg. Corp.**, Cleveland.

Howard M. Buchholz was named manager, Commercial Time Switch Div., **Paragon Electric Co.**, Two Rivers, Wis. He succeeds **Warren L. Peterson**, now manager of the West Coast office in Los Angeles.

Jack H. Schron, former vice president-manufacturing, was elected president of **Jergens Tool Specialty Co.**, Cleveland. **Neil J. Redmond** was made vice president-manufacturing; **Reed T. Weaver** vice president-finance.

Henry A. Tobey was elected vice president - manufacturing, Bearing & Rock Bit Div., **Timken Roller Bearing Co.**, Canton, Ohio. He succeeds **H. M. Richey**, retired. Mr. Tobey was general factory manager.

Bunker Hill Co., San Francicso, prior to appointment of a new president to succeed the late **John D. Bradley**, appointed **Emmett G. Solomon** (vice president) to function as interim chief executive officer.

Frederick F. Ward joined Mech-Tron Div., **Arrow Tool Co. Inc.**, Wethersfield, Conn., as sales manager. He was tool buyer in the Purchasing Dept. of Pratt & Whitney Aircraft Div., United Aircraft Corp.

Dudley W. Rockwell was elected president, **Stanley P. Rockwell Co.**, Hartford, Conn., to succeed the late **William A. Stumpf.** Mr. Rockwell has been active with the company for 23 years as a metallurgist and vice president-sales.

Donald H. Turk was appointed chief engineer, **Production Machinery Corp.**, Mentor, Ohio. He was chief design engineer.

Eugene A. Cook Jr. was appointed chief engineer, **Selas Corp. of America**, Dresher, Pa. He was staff engineer at Surface Combustion Corp.

Robert C. Robertson was promoted from director of sales to vice president-sales, a new post at **Acme Industries Inc.**, Jackson, Mich.

Allan Bird was named to the new post of sales development manager, **R. S. Landauer Jr. & Co.**, Matteson, Ill. He was with the Computer Div. of Burroughs Corp.

S&C Electric Co., Chicago, separated its research and engineering function. **Sigurd I. Lindell** was made vice president-research and engineering, **Charles H. Baker** engineering director, **John J. Mikos** research manager, **Harold H. Fahnoe** engineering manager.

OBITUARIES . . .

John H. Zurn, 34, vice president, **Zurn Industries Inc.**, Erie, Pa., was killed in an airline crash Dec. 1.

Patrick J. Gibbons, 69, retired executive vice president, **Vanadium Corp. of America**, New York, died Nov. 28.

John B. Tinnon, 74, retired vice president-sales, **Metal & Thermit Corp. of America**, New York, died Nov. 28.

Emanuel Hogenson, 71, former executive vice president, **Chicago Vitreous Corp.**, Cicero, Ill., died Nov. 26.

David C. McVey, a development manager for **Climax Molybdenum Co.** in Chicago, was killed in a plane crash Nov. 17.

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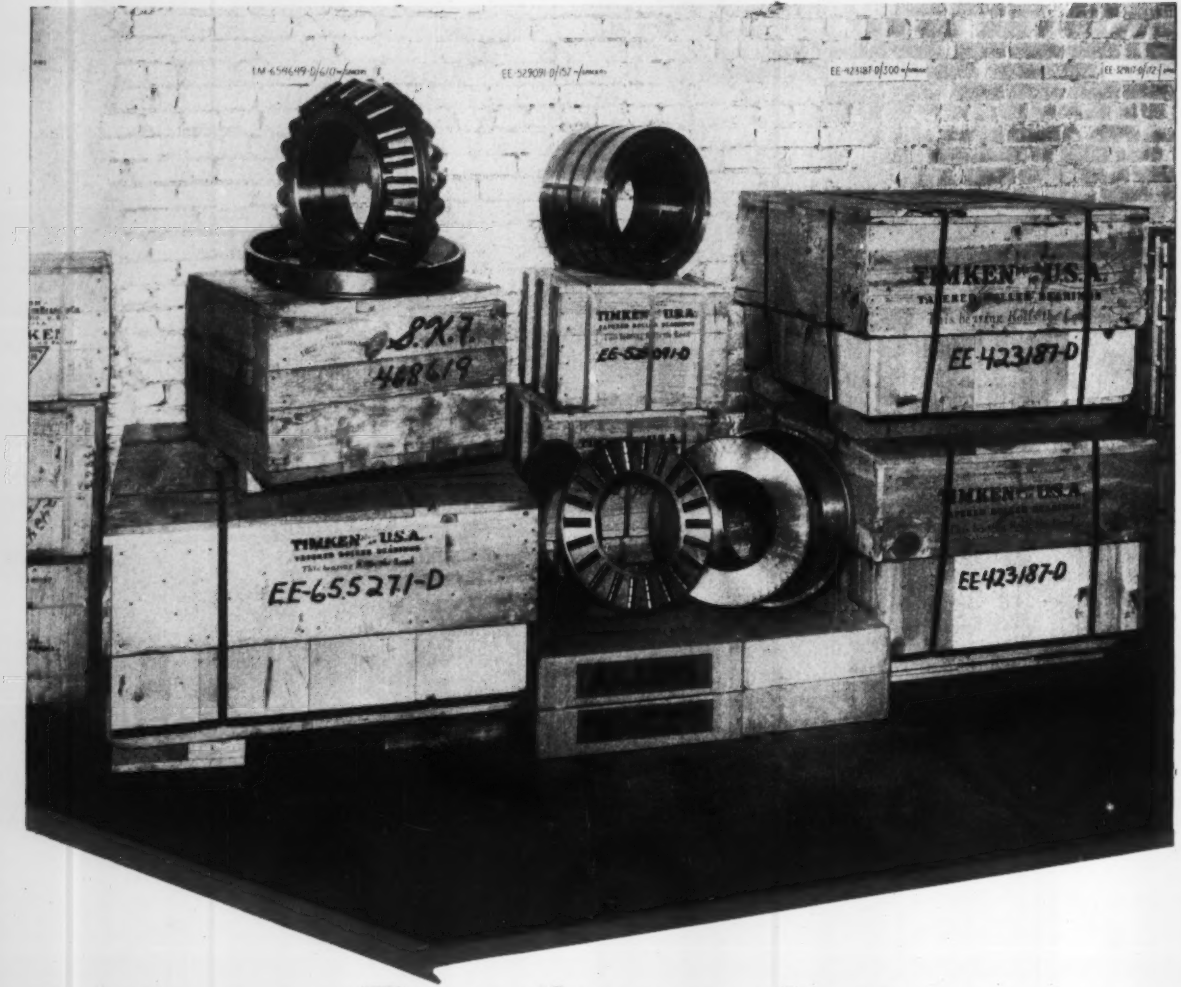

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U. S. Firms Strengthen Foreign Market Positions

MIGRATION of U. S. metalworking capacity to foreign countries is gaining momentum (STEEL, Nov. 30, p. 63). Machine tool builders are going abroad because of low manufacturing costs, tax breaks, tariff, and proximity to foreign customers. The considerations also apply to other branches of the metalworking industry. Some late developments:

- **Jones & Lamson Machine Co.**—The Springfield, Vt., machine tool builder has acquired a substantial interest in Le Progres Industriel, a machine tool builder in Lot (Brussels), Belgium. The new company, Le Progres Industriel-Jones & Lamson Machine Co., will manufacture and sell in the European Common Market the line of products made by Jones & Lamson in the U. S.

- **Gisholt Machine Co.**—The Madison, Wis., firm and John Lang & Sons Ltd., Johnstone, Renfrewshire, Scotland, have formed a manufacturing company known as Lang Gisholt Machine Co. Ltd. The jointly owned firm will occupy the John Lang & Sons factory for the production of the Lang line of lathes and power operated chucks and the Gisholt range of machine tools.

- **Marion Power Shovel Co.**—The Dalmuir (Scotland) Works of Babcock & Wilcox Ltd. will manufacture Marion Power Shovel excavators and cranes. Marion Power Shovel Co. is a division of Universal Marion Corp., Jacksonville, Fla.

- **Fried Steel Equipment Mfg. Corp.**—A licensing arrangement has been reached by this company with Weldall & Assembly Ltd., Stourbridge, England, under which Weldall will manufacture and sell Fried material handling equipment in all but two areas, the Americas and Canada.

- **Associated Spring Corp.**—Technical assistance in the manufacture of precision mechanical springs will be furnished by the Bristol, Conn., firm to Resortes Argentina SA, Cordoba, Argentina. The Argentine company may use the information furnished for any operations it may establish in Bolivia, Chile, Paraguay, Peru, and Uruguay. "All South America is growing, and the need for local manufacture of all types of products is growing proportionately," says Pablo G. Petrini, president of Resortes Argentina.

- **Willys Motors Inc.** — Brantford Coach & Body Ltd., Brantford, Ont., will manufacture Willys Jeep bodies under an agreement with Willys of Canada Ltd.

- **Lapointe Machine Tool Co.**—The Hudson, Mass., firm has formed a subsidiary, Lapointe Machine Co., to sell and service five of Britain's leading lines of machine tools in the U. S. The five lines are: Churchill Machine Tool Co. Ltd. (precision surface and internal grinders), John Lang & Sons Ltd. (large surfacing, boring, profiling, and screw cutting lathes), H. W. Ward & Co. Ltd. (large capacity ram type and combination turret lathes), J. Parkinson & Son Ltd. (milling machines and gear planers), and Butler Machine Tool Co. Ltd. (planers, shapers, and slotters).

Plans Larger R&D Building

Racine Hydraulics Machinery Inc., Racine, Wis., will add 21,000 sq ft to its research and development building. Cost: $170,000. J. E. Erskine is president.

National Carbon Expands

National Carbon Co., a division of Union Carbide Corp., New York, is expanding facilities for the production of impervious graphite heat exchangers.

Armetco Inc. Organized

Armetco Inc., a newly formed company, has purchased the plant and facilities formerly owned by Johnston & Funk Metallurgical Corp. in Wooster, Ohio. The firm will make wire and special mill shapes of titanium, zirconium, tantalum, columbium, vanadium, and a wide variety of steel alloys. It will also do consumable electrode vacuum melting of steel and nonferrous alloys. A. E. Franks is president.

Timken Expands Tube Mill

Timken Roller Bearing Co., Canton, Ohio, will build a $4.5 million tube piercing mill during 1960-61 at its Gambrinus, Ohio, plant. The No. 4 piercing mill will add 30 per cent to piercing mill tonnage. Present piercing facilities of the Steel & Tube Div. are at the Canton, Gambrinus, and Wooster, Ohio, steel plants.

Mirro Aluminum Expands

Rolling mills and auxiliary machinery for the $12 million expansion of Mirro Aluminum Co., Manitowoc, Wis., have been supplied by Loewy-Hydropress Div., of Baldwin-Lima-Hamilton Corp., New York. A Loewy, reversing hot breakdown mill will roll 5000 lb aluminum slabs down to thin plate and to coiled strip. An extra wide cold strip mill will reduce a part of the strip production to finished sheet gages suitable for the manufacture of cooking utensils, electrical appliances, toys, and similar goods. A third installation, a high speed Loewy Hydromil, will further reduce strip to aluminum foil as thin as 0.00025 in. The plant will be in full operation by the first of the year.

Ups Sulfuric Acid Output

Pittsburgh Coke & Chemical Co., Pittsburgh, is expanding its Neville Island, Pa., sulfuric acid plant capacity by 70 per cent. Completion is scheduled for early 1960.

Installs Annealing Units

Chase Brass & Copper Co., Waterbury, Conn., has installed two annealing furnaces at its Cleveland plant. Each of the furnaces will approximately double the annealing capacity of the furnace it replaces. One furnace is used for bright annealing of copper tube in coils while the other is designed to handle 7500 lb per hour of tube in straight lengths.

Closes Gearing Div. Plant

Westinghouse Electric Corp., Pittsburgh, will discontinue operations at its Nuttall, Pa., plant because "declining sales volume can no longer support a separate Gearing Div." The division's operation will be consolidated with related product lines at Westinghouse's Motor & Control Div. at Buffalo.

Acquires Press Line

Whitney Metal Tool Co., Rockford, Ill., purchased a throatless shear and cam press line from Marshalltown Mfg. Co., Marshalltown, Iowa.

Casting Shop Enlarged

Michael Flynn Mfg. Co., Philadelphia, is constructing a billet casting shop at its California plant. Equipment will include a continuous casting machine being supplied by Lobeck Casting Processes Inc., New York. The machine will simultaneously cast 24 billets 6 in. in diameter and 20 ft long. Capacity: 20,000 lb of billets an hour. Michael Flynn specializes in producing aluminum curtain walls, prime windows, sliding doors, extruded shapes, structurals, and tubing.

Research Center Opened

Fairbanks, Morse & Co., Chicago, opened a research and development center and laboratory at Beloit, Wis. The firm's research budget will be increased to $2.5 million for 1960 from $1.5 million for 1959.

Builds Foundry Addition

Precision Castparts Corp., Portland, Oreg., will construct a 15,000 sq ft addition to its plant, bringing total floor space to 50,000 sq ft. The addition is scheduled for completion early in 1960 and will provide space for the company's expanding research and development departments and for additional production facilities. The company produces high strength, high temperature alloy castings.

NEW PLANTS

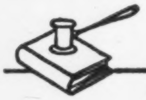
National Can Corp., Chicago, is constructing three plants. One is a 125,000 sq ft facility at Hanover, Pa., which will be ready for production in the second quarter of 1960. It will have a weekly production capacity of more than 15 million cans.

Chase-Shawmut Co., Newburyport, Mass., a subsidiary of I-T-E Circuit Breaker Co., Philadelphia, is in full scale production in its new 56,880 sq ft plant and office building. The company makes electrical fuses.

Bridgeport Brass Co., Bridgeport, Conn., will lease a $400,000 office and warehouse being built at 2051 N. 17th Ave., Melrose Park, Ill.

NEW ADDRESSES

Crown Zellerbach Corp. transferred its headquarters offices to 1 Bush St., San Francisco 19, Calif.



ASSOCIATIONS

Plumbing Brass Institute, Pittsburgh, elected these officers: President, Roger Milroy, Lee Bros. Foundry Co. Inc., Anniston, Ala.; first vice president, Martin Peterman, Milwaukee Faucets Inc., Milwaukee; second vice president, Ford V. Cowing, Repcal Brass Mfg. Co., Los Angeles; treasurer, Norman Lougee, Chicago Faucet Co., Chicago. Hanson & Shea Inc. was renamed executive secretary.

Walker L. Cisler, Detroit Edison Co., Detroit, has assumed the presidency of the **American Society of Mechanical Engineers**, New York. He succeeds G. B. Warren, General Electric Co., Schenectady, N. Y.

American Home Laundry Manufacturers' Association, Chicago, elected these officers: Chairman, H. L. Travis, Kelvinator Div., American Motors Corp., Dearborn, Mich.; vice chairman, C. G. Ely, Maytag Co., Newton, Iowa; and treasurer, G. M. Sheehan, Home Laundry Dept., General Electric Co., Schenectady, N. Y. Guenther Baumgart continues as president and chief executive officer.

CONSOLIDATIONS

Texokana Bolt & Nut Co., Dallas, and **Gulf Coast Bolt & Nut Co.**, Houston, have merged with **Sterling Bolt Co.**, Chicago. The move follows an earlier merger of **East Coast Nut & Bolt Co.**, New York, and **Penn Bolt & Nut Co.**, Pittsburgh, with Sterling.

Lithium Corp. of America Inc., Minneapolis, acquired **Fulton-Irgon Corp.**, Dover, N. J., which is active in various phases of rocketry. David Fulton will become a vice president of Lithium Corp. with responsibility for the management of the Fulton-Irgon Div. Uses of lithium chemicals and alloys in aircraft and missiles are expected to increase substantially.

Pendleton Tool Industries Inc., Los Angeles, will acquire **Vlchek Tool Co.**, Cleveland, subject to stockholders' approval. The purchase involves Vlchek's operating assets only. E. C. Koster will continue as president of the new Pendleton subsidiary and L. F. Storie will be executive vice president.

Wilson Bros., New York, acquired **Lawson Mfg. Co.**, New Kensington, Pa., maker of water heaters. L. J. Lawson is president of the new Wilson subsidiary; Eugene Blades, executive vice president.

Hamilton Mfg. Co., Two Rivers, Wis., purchased **Haldeman-Homme Mfg. Co.**, St. Paul, manufacturer of folding tables, stages, and choral risers.

General Magnaplate Corp., Belleville, N. J., acquired **Eastern Testing Laboratories**, Corona, N. Y., engaged in nondestructive testing. General Magnaplate tests materials, products, and components; and specializes in electroplating, coating, metal treatment, and related industrial finishing operations.

International Harvester Co., Chicago, is negotiating for purchase of Solar Aircraft Co., San Diego, Calif.

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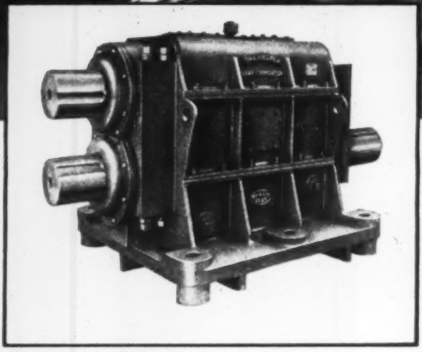

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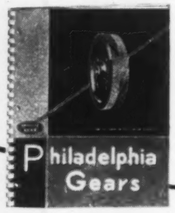

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STEEL

December 14, 1959

Technical Outlook

ENGINE HAS TWO PARTS—A new rotary engine can deliver four times the power per pound and twice the power per cubic foot of a comparable piston engine, claims its developer, Curtiss-Wright Corp., New York. The engine can be stacked and is said to be cheaper to build and operate than standard powerplants.

QUICK VERTICAL WELDS—Latest addition to the U. S. complement of heavy welding machines is Arcos Corp.'s Vertomatic, a Belgian version of the electroslag process. The Philadelphia firm says the process approximates continuous casting, producing exceptionally smooth, high grade joints in plates 1½ in. or larger.

RELIABILITY CENTER—An electronic component reliability center has been established at Battelle Memorial Institute, Columbus, Ohio, by 11 co-operating firms. Purposes: To evaluate reliability of parts furnished by the firms and to provide new techniques for improving reliability programs. The center greatly reduces duplicate efforts by member firms.

NEW TOOL CONTROL—A new two-axis, transistorized device (made by Hughes Aircraft Co., Los Angeles) permits machine tool positioning to within 0.0002 in. (repeatable) at speeds up to 180 in. per minute.

SNORKEL DEGASSING— A new German method of vacuum degassing molten steel will be installed early next year at the Midland Works of Crucible Steel Co. of America. Ladles are placed under a vacuum tank which has a long tube. Steel boils up the tube into the vacuum chamber. Agitation promotes degassing, removing more than half the oxide inclusions, eliminating all hydrogen flaking and reducing the nitrogen content.

FIVE PREDICTIONS— The High Temperature Symposium at Asilomar, Calif., brought these predictions for metals which have melting points above 3400° F: 1. Tantalum and rhenium will be easier to get. 2. Electron beam melting facilities will eventually be as important as sintering and arc melting in consolidating refractories. 3. Tungsten sheets will be formed into products with useful ductility. 4. Chromium sheets will be made reasonably ductile. 5. Columbium-base alloys will meet leading edge requirements of missiles.

NEW INSTRUMENT PANELS—Automen may try aluminum or plastic instrument panels, STEEL editors have learned. Buick has asked for bids on a one piece plastic design—openings and brackets would be molded right in. Fisher Body Div. is asking for bids on a two piece diecast aluminum job which can be welded or bolted together. Bid requests are termed "exploratory," but if suppliers turn up, changes may be scheduled for '62 models.

GAS-FIRED SALT BATHS— A new unit, fired by gas or liquid propane, lifts the size limit of fused salt units, claims Ajax Electric Co., Philadelphia. The design permits fast startups following shutdowns.

NEW HOT SKIN—The Navy attack-bomber (A3J Vigilante) has a lithium-aluminum alloy skin, says the Aluminum Co. of America, Pittsburgh. It weighs some 3 per cent less per airplane than other aluminum alloys. Lithium increases elasticity or "give."

SHIPS GO FOR ALUMINUM—The new British liner *Oriana* sports a 1040 ton superstructure of welded aluminum. Automatic, inert gas, metal arc (Sigma) welding was used to join the aluminum for the $35 million vessel.

HELP ON STANDARDS— The National Bureau of Standards, Washington, annually distributes 60,000 samples of 600 standard materials to laboratories to help them maintain the accuracy of their equipment. About 150 new materials will soon be added to the standards, the agency says.

How to Buy Better Welding Quality

In this sequel to "Are Too Many Tests Hurting Welding?" (STEEL, July 20, p. 84), an outstanding authority asks for more intelligent use of testing. Here are some rules he offers to help you avoid common pitfalls in this field

By **HELMUT THIELSCH**
Metallurgical Engineer
Grinnell Co. Inc.
Providence, R. I.

CONTINUED, unreasonable price cutting is forcing many firms to fudge on weld quality.

And the practice isn't being discouraged—there's also a definite trend toward looser inspection requirements.

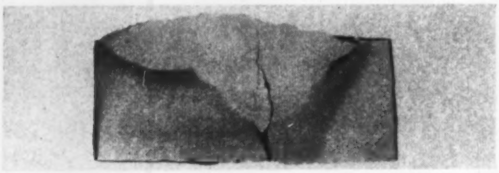
It's a case where the user must initiate remedial action. He must insist on stricter adherence to welding standards.

- **The burden falls on the people who control specifications for weldments. Their emphasis on low price saps a bidder's desire to do a quality job.**

A properly prepared initial bid teamed with a good purchasing specification go a long way toward eliminating sharp competitive practices. It's not too difficult to fool an uninformed buyer—we have several cases on record where buyers accepted fabrications with hidden flaws only to learn too late they couldn't recover their losses.

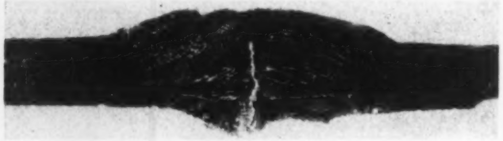
Here are some rules and some fairly common examples which will give you a better understanding of welding problems and help you obtain better quality:

1. Put the contractor's experience and reliability at the top of your priority list. (You might try the quality control system described in the Dec. 7 issue of STEEL, p. 142.)



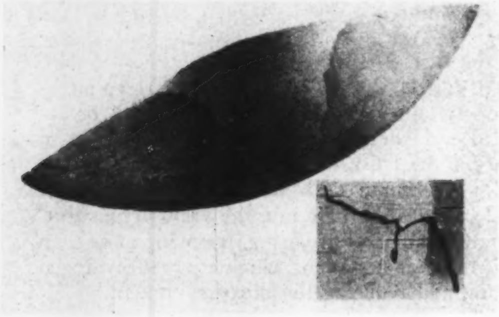
Proper technique by the contractor could have prevented the cracks. They were caused by stress corrosion which resulted from improper fitup and welding of butt joints in pipe.

2. When needed, specify copper backup bars in atmosphere welding of alloys. They are almost indispensable to high grade results.



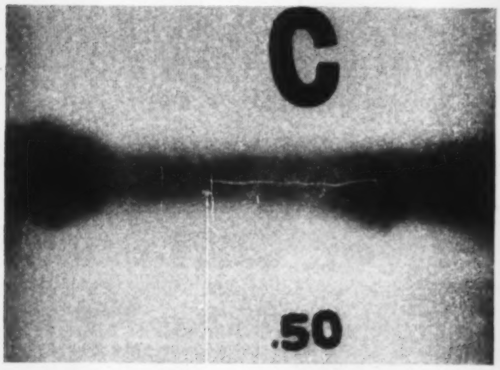
The scale trapped in that "commercial" weld in stainless was at the bottom of a service failure. It was formed on the underside of the first pass during inert gas, tungsten arcwelding and was buried by the second pass on the opposite side. A good backup bar purged with inert gas would have produced a sound weld. An alternative: Grind before welding the second pass.

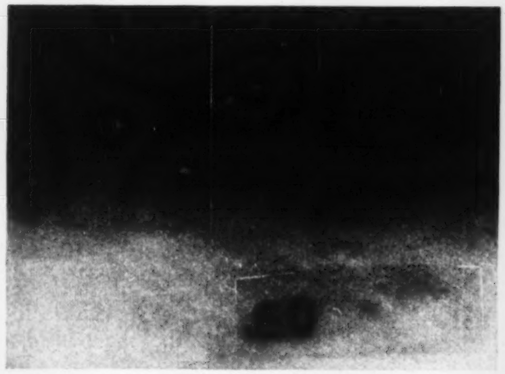
3. Specify the correct welding electrode. Incorrect types can permit the development of hidden cracks which can't be detected visually.

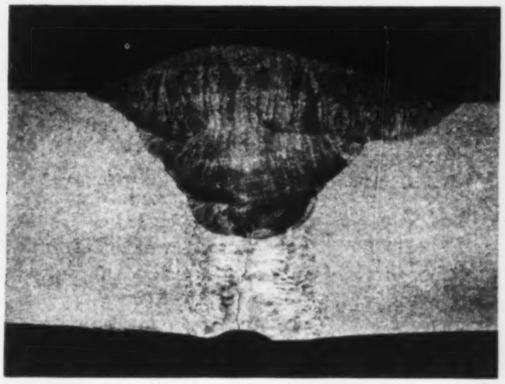


That crack began in the welded area of a 1000° F pressure vessel made of 1 Cr-½ Mo steel welded with a ½ Mo electrode. Cracking would have been eliminated if a 1 Cr-½ Mo electrode had been specified. Manufacturers of electrodes and the American Welding Society are good sources for such information.

4. Specify the nondestructive testing technique to be used, but study the functions and limitations of each method. Here are some examples:



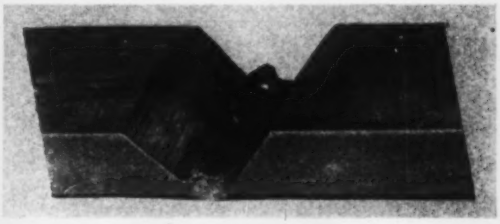




The crack in the root weld (bottom) would never be judged acceptable by any standard, yet only one radiograph turned up the defect. Both x-ray techniques clearly reveal the 2 per cent sensitivity strip (labeled .50) used for checking performance.

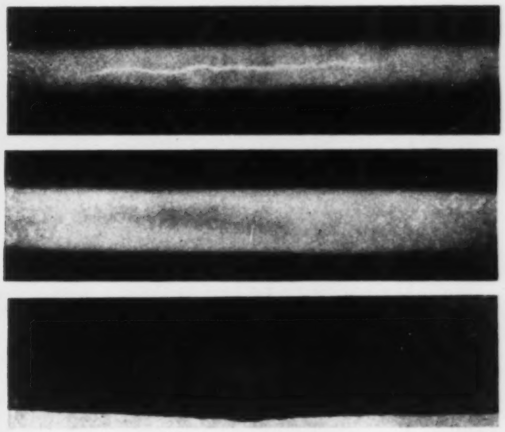
Major types of weld defects have been graded by the American Society for Testing Materials (Spec. E99-55T), but limits of acceptability are left up to the purchaser and supplier.

5. For high grade welds, specify consumable inert rings.



The illustration shows how they are used. Such devices greatly assist an operator in making sound root passes, especially in pipe buttwelding. Leaving the choice to the fabricator (a common practice) may severely penalize the reliable firm.

6. The dye-radiograph combination applied to the first, or root pass, is far more revealing on buttwelds made from one side than any other testing of completed welds.



The $2\frac{1}{2}$ in. crack in the root pass of a 6 in. pipe is readily seen in this x-ray. A subsequent pass made it invisible. Cracks which don't penetrate the root pass cannot be picked up with dye penetrants.

• Some defects defy detection by any nondestructive test method. Again, your effort to certify the reliability of a bidder will pay dividends.

We don't consider it good engineering thinking to blindly specify nondestructive testing. Many engineers specify costly and superfluous techniques.

Nuclear reactor welding furnishes many such examples. It's common to find all completed pipe welds being tested by 1. Dye penetrants. 2. Radiography. 3. Mass spectrometer.

• Summary: It is no more costly to produce a sound weld once procedure has been established. The governing factors: Responsibility of shop supervision and thoroughness of welder training.

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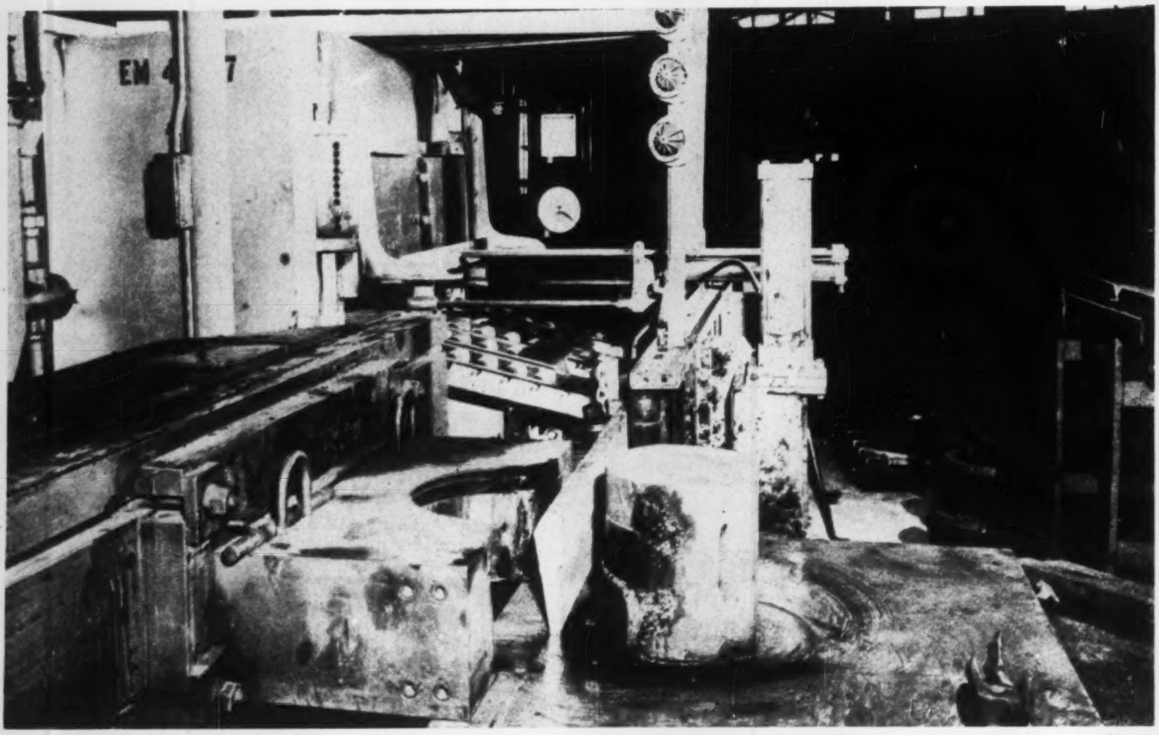


The weldment (a cylinder head retainer) starts as a wedge shaped bar heated to 1700°F in the furnace and cut to length

Electromolding Technique Trims Cost of Parts

The welding method is used by Electro-Motive Div. of GM to make major assemblies for diesel engines. Parts are said to be light and strong and can be held to close tolerances

MANY of the major assemblies produced for diesel train engines at Electro-Motive Div., General Motors Corp. (Chicago) are weldments. R. L. Peterson, senior process engineer, says the parts are light, strong, and can be held to close dimensional limits. Savings per part are significant. For example, a cylinder head retainer costs only 11 to 12 cents a pound.

A welding technique called electromolding is used. A special setup and machine are required, but a high quality, uniform weld can be made.

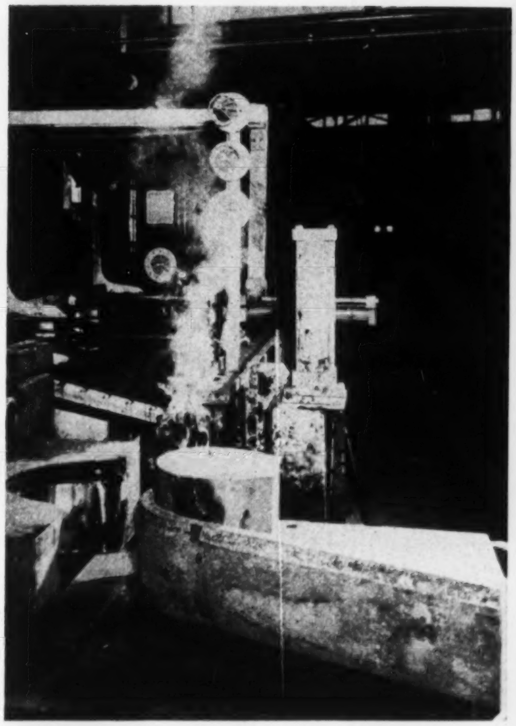
• **Problems**—When Electro-Motive decided to make the retainer from rolled stock, a welding problem had to be solved. The company knew the sleevelike part could be welded at a longitudinal joint, but the tapered section was a stumbling block. In addition, submerged arc-welds were preferred to the hand type. Multiple pass welds had to be avoided.

• **Electromolding**—The setup: In a normal cycle, 30 bars are fed automatically through a walking beam furnace at 1700° F. One bar is loaded and one discharged every 4 minutes. Bars are power fed lengthwise into a 200 ton bulldozer in which a curved recess die forms a piece with the required diameter and gap around a fixed mandrel.

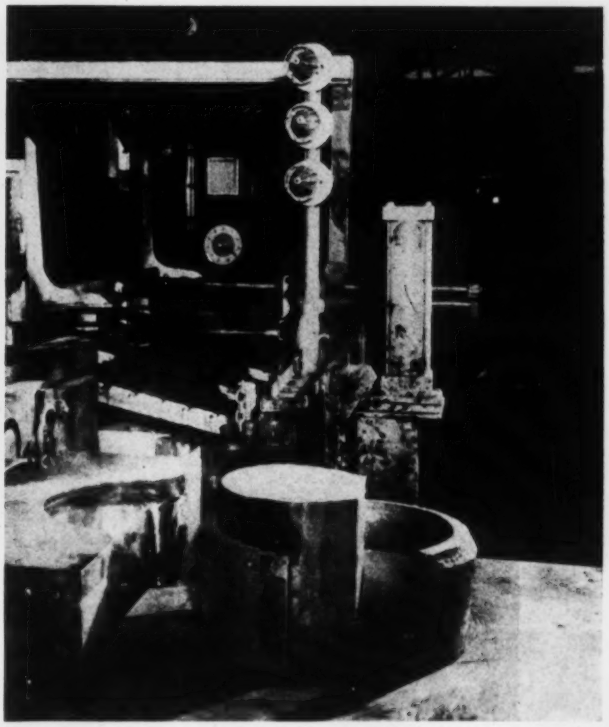
Handling on the bulldozer table is manual. The sleeve is lifted by trolley tongs to the three station electromold machine. It's lowered over a central mandrel at the station to be used, with the thicker section at the top. Hydraulic clamping brings the weld gap to the correct 1 in. dimension between the square and parallel ends.

The water cooled hydraulic dams (one inside and one outside the retainer) are also closed hydraulically. A steel bar gripped by a ground clamp maintains the welding ground. The well to be filled with weld metal is about 7 in. deep and 1 in. wide. Flux protects the copper dams against erosion.

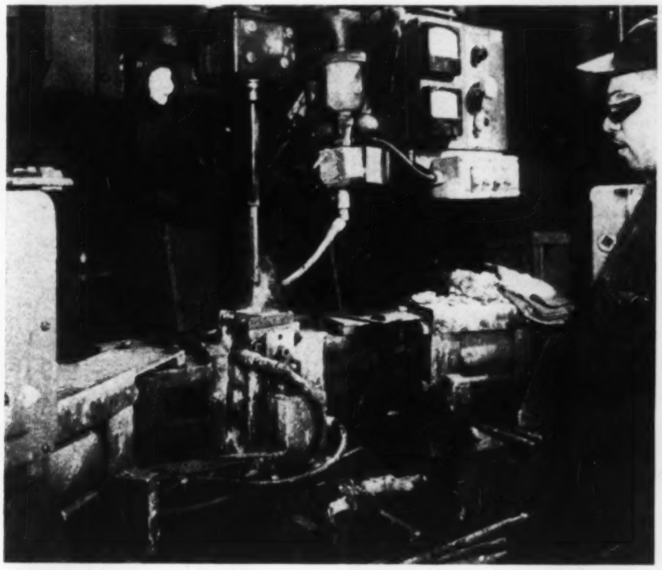
• **Joining**—The welding head (Lincoln Electric LAF) can be used in all three stations. Welding is done at about 38 volts dc (straight polarity), providing an average current of about 1150 amperes supplied by two, 750 ampere generators. Voltage and current are increased slightly as the welding proceeds. About 4½



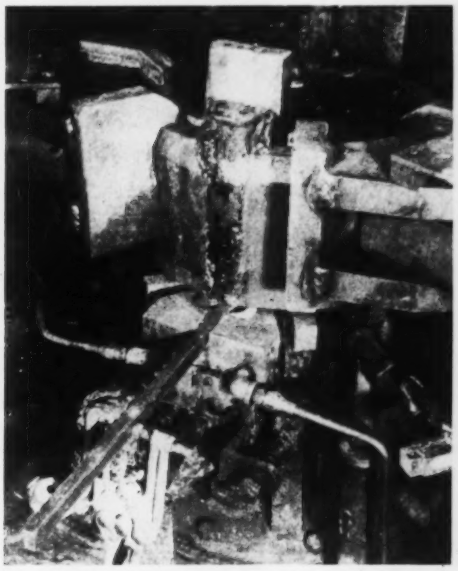
This is the first step in forming the sleevelike part. The 200 ton bulldozer moves against a fixed mandrel



After additional forming, the part approaches final shape, but the gap between ends must be reduced to 1 in. before welding



The electrode wire is fed by a modified Lincolnweld head into a well enclosed by water cooled dams. Flux is fed from small glass hopper



Here's the weld with the grounding bar attached. The weldment is ready for more processing

minutes of arc time are required to complete the weld (loading, clamping, and unloading time is not included).

After a weld is completed, the head is moved; the copper dams and clamps are retracted; and the weldment is lifted out with loading tongs. The weldment is ready for machining, following cutting of the grounding bar.

Subsequent welding includes hand arcwelding of the retainer into a mating hole in the top of the crankcase and cutting an elongated hole into which an exhaust elbow is welded.

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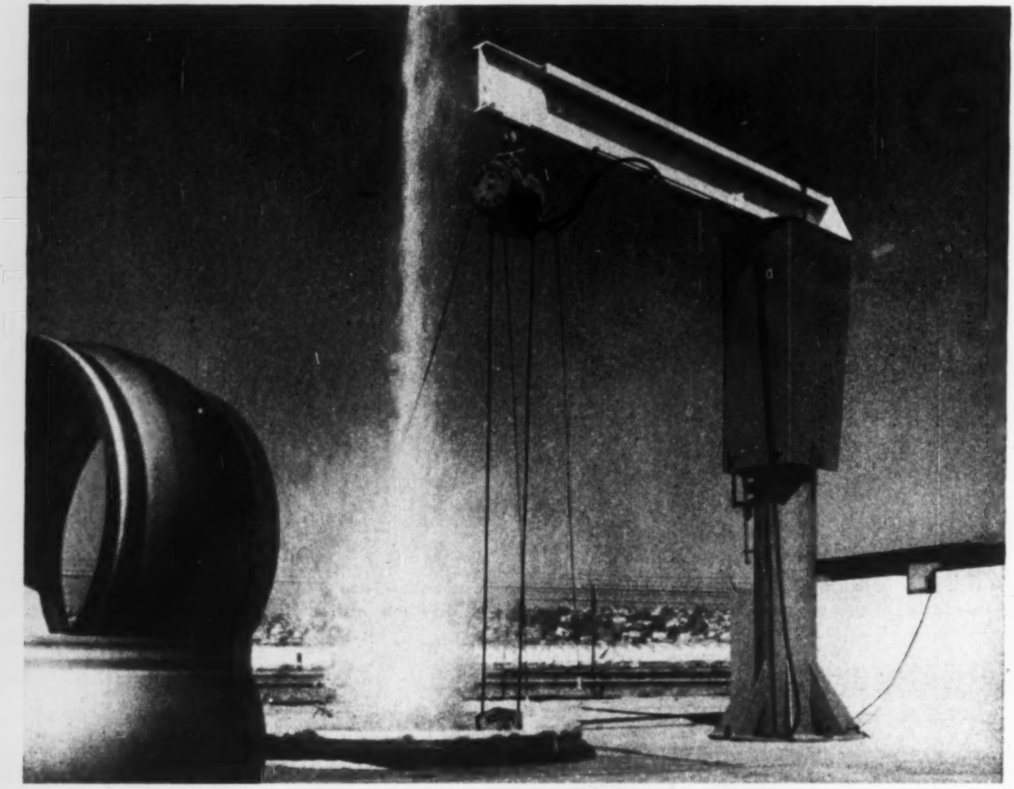


A geyser of water shoots skyward in San Diego, Calif., as . . .

Explosive Forming Goes Commercial

ENGINEERS at Ryan Aeronautical Co., San Diego, Calif., have converted a neophyte forming technique (explosive forming) into a full scale, dependable production method—and they are making it pay off.

Most of the parts explosively formed at Ryan are done on subcontract for other aircraft manufacturers. Nearly always, the technique is saving the customer whopping amounts of dollars or time. In some cases, tolerances or shapes are produced that would be nearly impractical with any other production system.

- **Ryan's engineers have started to define explosive forming's role in production forming.**

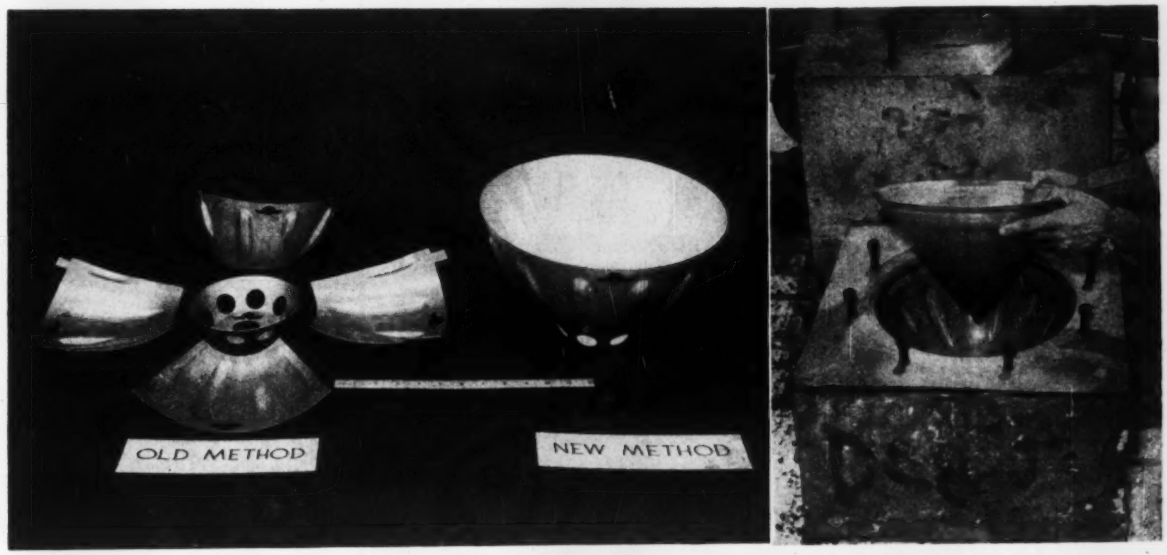
First, they conclude, the process is a natural for most high strength or high temperature resistant alloys that are troublesome in conventional forming. Parts representing nearly the whole formability range, from aluminum through René 41 and titanium, have been turned out.

Second, parts that would be impractical (if not impossible) to produce with conventional diesets can often be routine jobs with explosive forming. Since work hardening is reduced (but not eliminated), sometimes costly process anneal stages can be skipped. Further, the omnidirectional explosive shock wave can do forming stunts that ordinarily would beget tearing or wrinkling. Example: A series of dimples in a severely deformed cone.

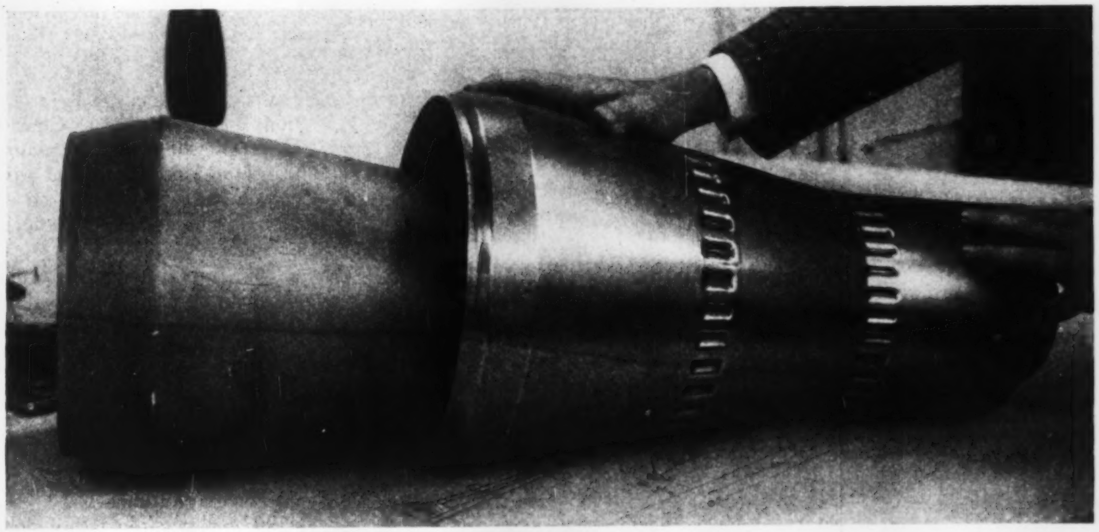
Third, tolerances that are next to impossible to hold conventionally can be taken for granted on explosive forming or sizing. The asset can be attributed to a minimization, if not elimination, of forming's gremlin, springback.

Ryan engineers point out that their dies are made to nominal size, and the parts can always be formed to within 0.002 in. of the die drawing. If that's springback, it's no problem.

- **Explosive forming, say the Ryan**



This dome fits just inside the entry end of the jet engines used on the Douglas DC-8 air liner. Made from 0.040 in. thick 6061 aluminum, it used to be fabricated from five stampings that were resistance welded. Each dome cost $131 vs. $15 now. The job is done by rolling a cone, fusion welding the seam, and finally exploding the shape in two stages. Photo at right shows the cone blank and the die



This shroud is made from two explosively formed semicylinders. The dimples in the part at right serve as spacers that control the gap between the two walls. The parts are resistance spotwelded at the dimples. The old method (done without the dimples) called for 130 spacer blocks between the parts, some complicated fixturing to hold them, and a brazing operation to join the parts and spacers into a firm assembly

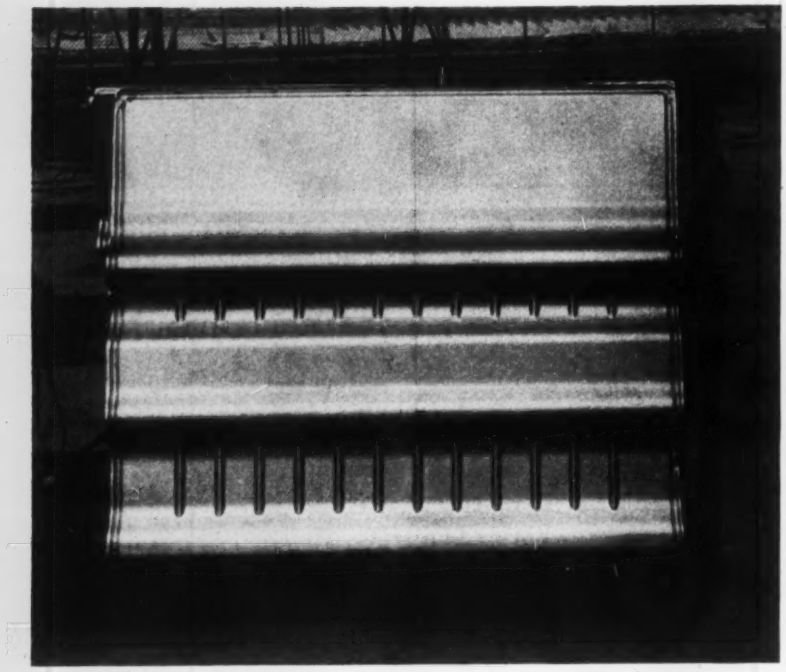
experts, won't replace conventional forming, but it can become a full fledged member of the team.

Nearly limitless energy (from a forming view) is available. Huge parts that might otherwise require tremendous expenditures for capital equipment can be formed easily in single die elements with relatively small portions of explosive.

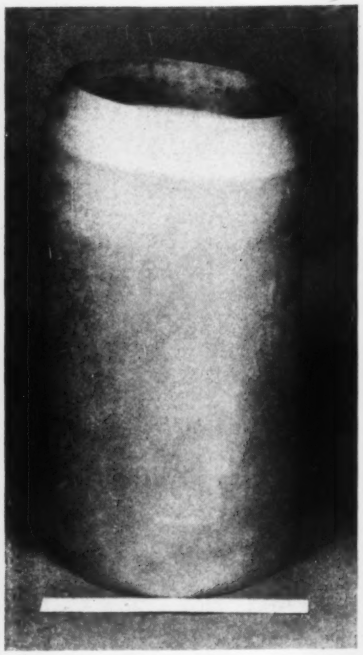
Ryan engineers also are convinced explosive forming has been oversold on two basic counts: 1. They say parts do work harden—less than in conventional forming but still enough to necessitate reduced annealing efforts on severe shapes. 2. In severe deformation, wall thickness of the part is reduced.

- **Installation is simple enough to be duplicated anywhere.**

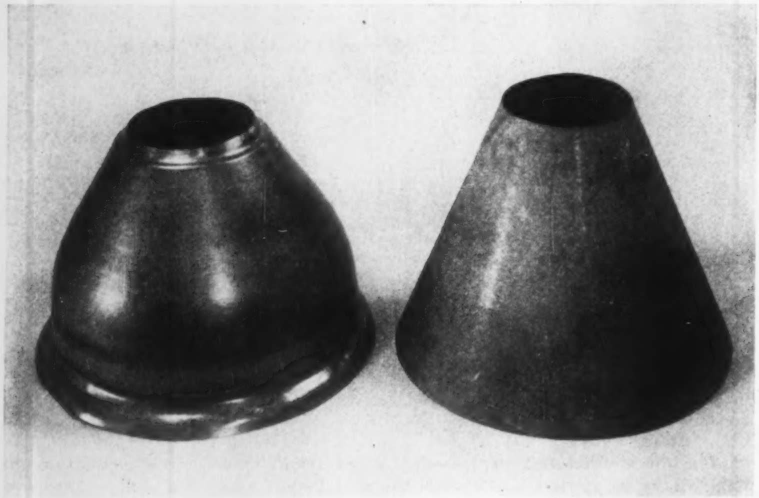
Ryan's explosive forming tank,



This is a baffle for an aircraft nuclear propulsion system. It's made from 0.043 in. thick Inconel. Explosive sizing on the 5 ft square part brings all points to within 0.006 in. of the die dimensions, and the tolerances must be held when the part is unsupported. Initial forming (to within about ¼ in. of the die) is done in a hydraulic press



This asymmetrical tailpipe is for the Ryan Firebee jet target missile. It's formed from a rolled and welded cylinder of 0.036 in. thick 321 stainless



The Rene' 41 diffuser cone at left used to take 10 hours to complete, including a series of process annealing steps. Now the part is explosively formed from the rolled and welded cone at right in a single blow. Total time: 15 minutes

which is filled with water, is 8 ft deep. Dies and blanks with properly rigged explosives are lowered into the tank; the explosive is detonated. A partial vacuum (12 to 14 mm of mercury) is drawn between the part and the die, so the metal can push flush against the die walls without air interference.

Nearly all conventional explosives have been tried successfully. Shape and weight of the explosive charge are critical, and the factors become part of acquired knowhow. For the guidance of Ryan production men, Engineer Charles O. Coffer developed a calculator that translates pressure and part-to-charge distance into charge weight. Normal charge shapes are cylinders or spheres.

Dies are usually Kirksite, but they can be made from steel or built up with layers of epoxy and Fiberglas. Plaster has done the job on some extremely short runs.

About six different parts are in production. Most are short run jobs (25 to 30 parts), but a few, like the DC-8 jet engine cone, have run into several hundred.

Success, say the Ryan engineers, takes only a couple of ingredients:

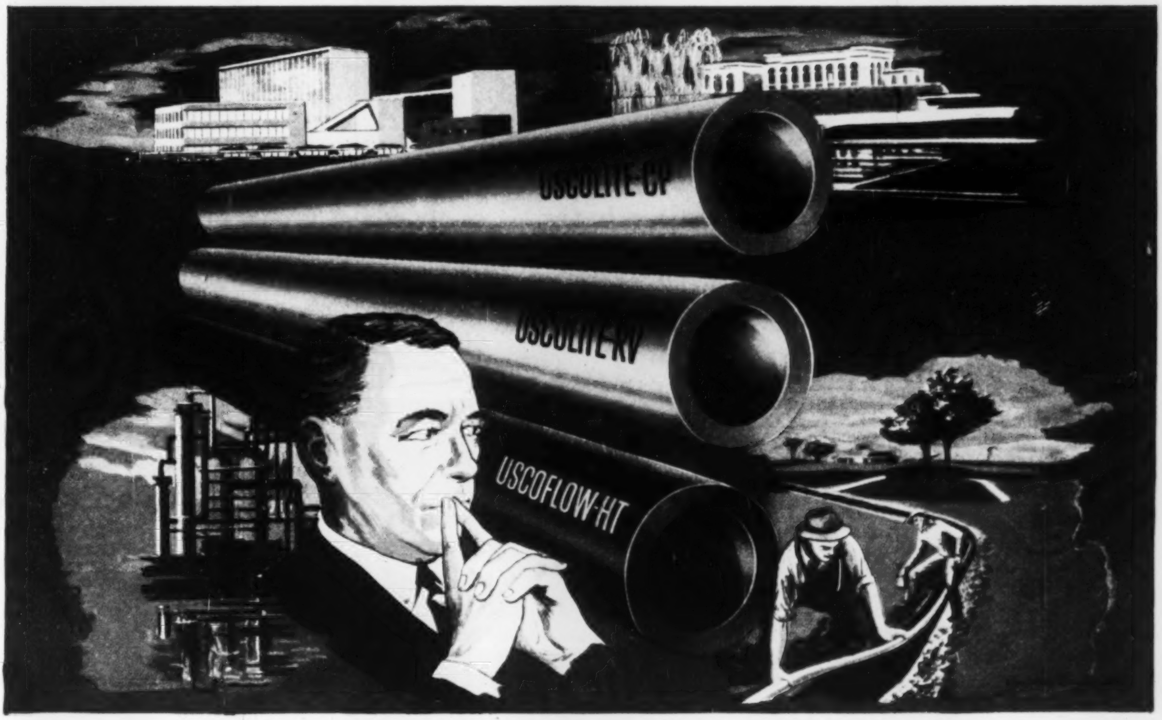
First, some sound knowhow in metal forming and in explosive technology.

Second, a willingness to try and fail, then try some more.

The rewards: A system for metal forming that can turn the problem jobs into profit dollars. And it can turn product designers loose into a whole new realm of shapes, materials, and tolerances.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

USCOLITE PLASTIC PIPE



CONFUSED ABOUT PLASTIC PIPE?

(MOST EVERYONE IS)

Here's your guide:

U. S. Uscolite® CP acrylonitrile-butadiene-styrene copolymer (ABS-I) pipe is best where maximum resistance to impact is demanded. It will safely handle most chemicals of industrial importance at working temperatures up to 170°F. This is the major plastic pipe used by chemical processing industries.

U. S. Uscolite RV polyvinyl chloride (PVC-I) pipe is best for extremely active oxidizing agents such as strong sulphuric, nitric and chromic acids. This unplasticized, unmodified Type I PVC has high impact strength and handles temperatures up to 140°F, far in excess of normal requirements.

Uscolite HT (ABS-II) pipe is a new addition to the resin-rubber compounds. HT stands for exceptionally High Tensile qualities, plus much better retention of physical properties at High Temperatures.

These types of Uscolite Pipe cover all requirements, not only because they are virtually immune to internal and external corrosion, but they are non-contaminating, odorless, impart no taste or discoloration. Because of these qualities they are approved by the National Sanitation Foundation for carrying drinking water. The use of Uscolite results in a saving of appreciable dollars in installation costs and reduction in man-hours. The skills to install metal pipe are not required to install Uscolite. Assembly can be accomplished in half the time. *Not one foot of Uscolite Pipe has ever failed in service when used in accordance with our recommendations.*

A fourth pipe, *UscoFlow HT (ABS-II)* is a black utility pipe, especially suitable where low first costs are a factor. It's a blend of styrene-base resin and synthetic rubber for good impact resistance and high tensile strength. UscoFlow is the ideal answer to builders and large developers who are seeking long-lived, maintenance-free pipe for plumbing.

• • •

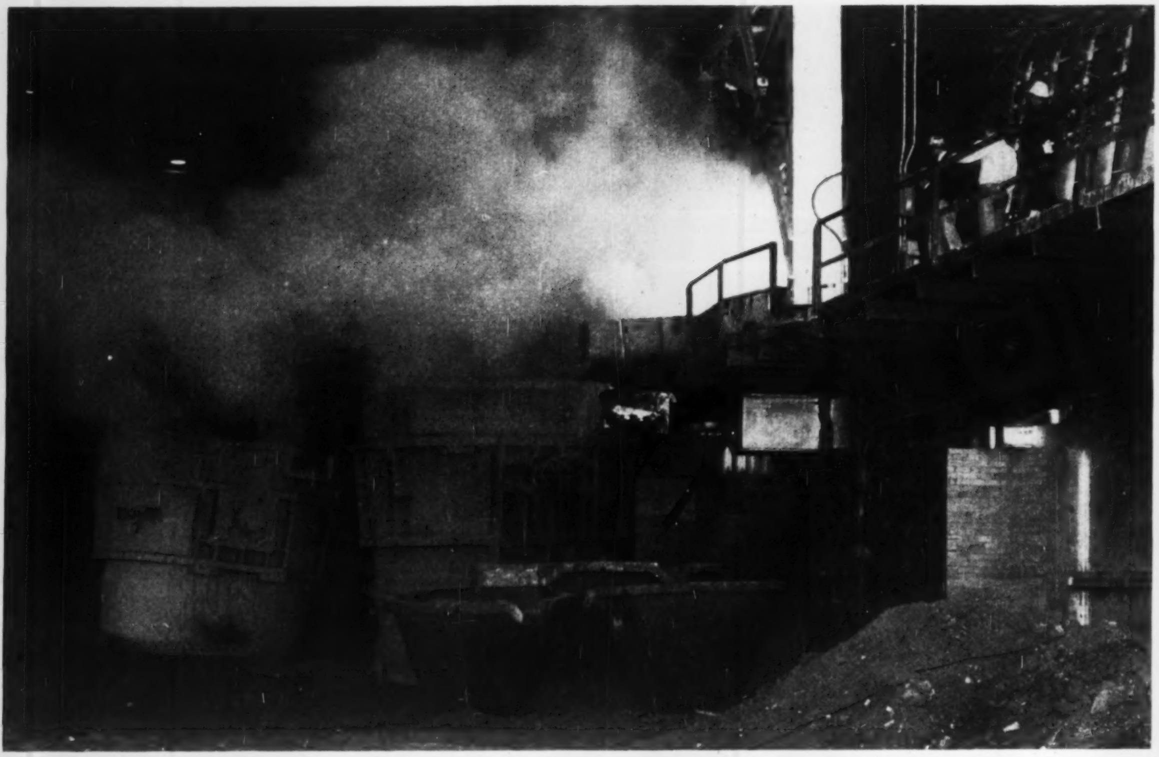
Get the "U. S." plastic pipe facts from any of our strategically located branches, or write United States Rubber, Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

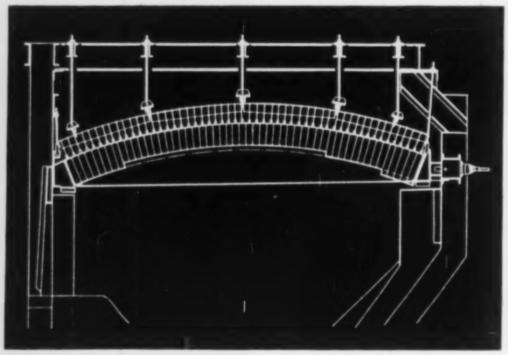


First heat is tapped from new furnace, which produces 175 tons of steel every 12 hours

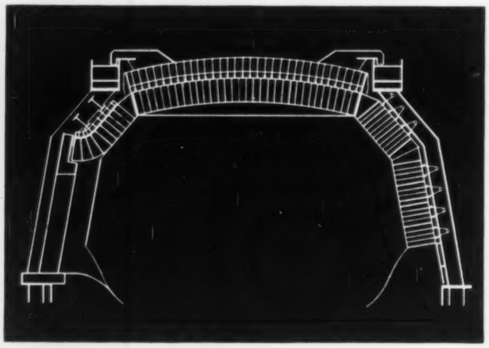
All Basic Open Hearth Boosts Keystone's Output

STEELMAKING capacity was hiked from 475,000 to 600,000 ingot tons a year at Keystone Steel & Wire Co., Peoria, Ill., when the company put a new, all basic open hearth into operation.

The furnace, a modification of the Maerz-Boelens design, was en-



Conventional furnace has vertical front wall; back wall slopes outward . . .

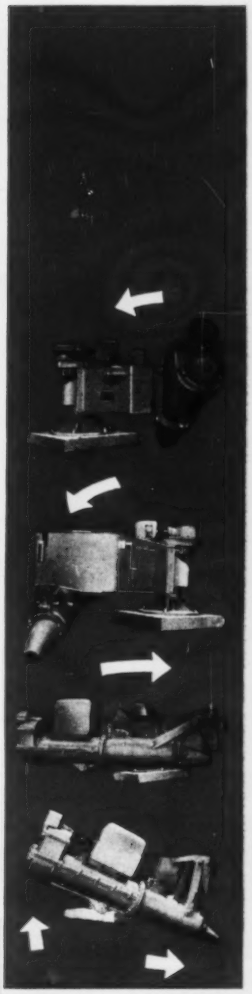


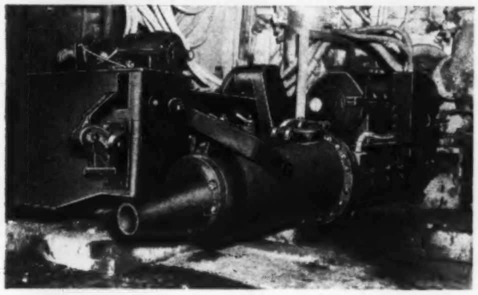
. . . New open hearth has sloping front and back walls, shorter roof span

ACCURACY + POWER

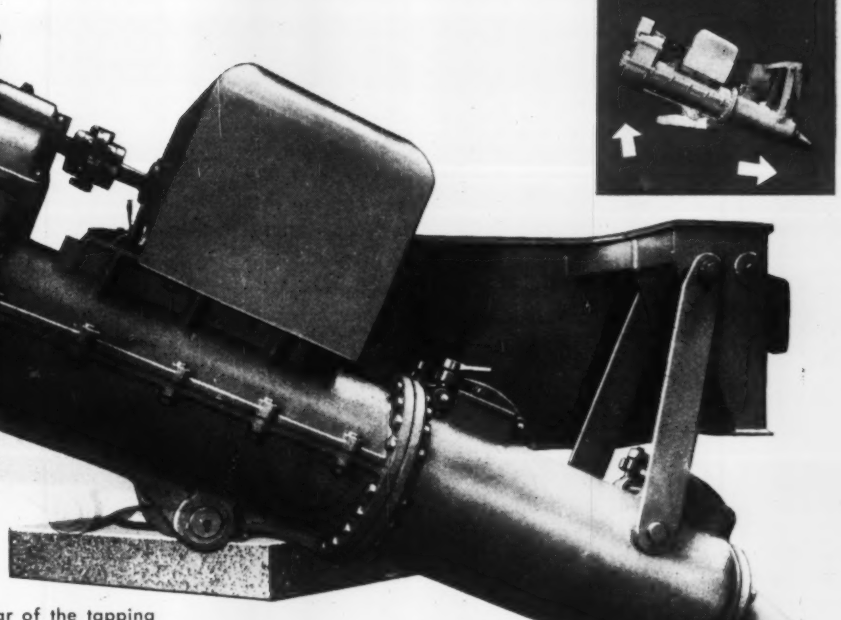
FOR MAINTAINING LONG TAPPING HOLES

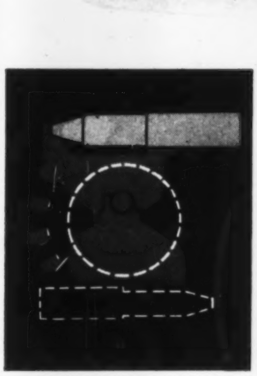
BAILEY CLAY GUNS





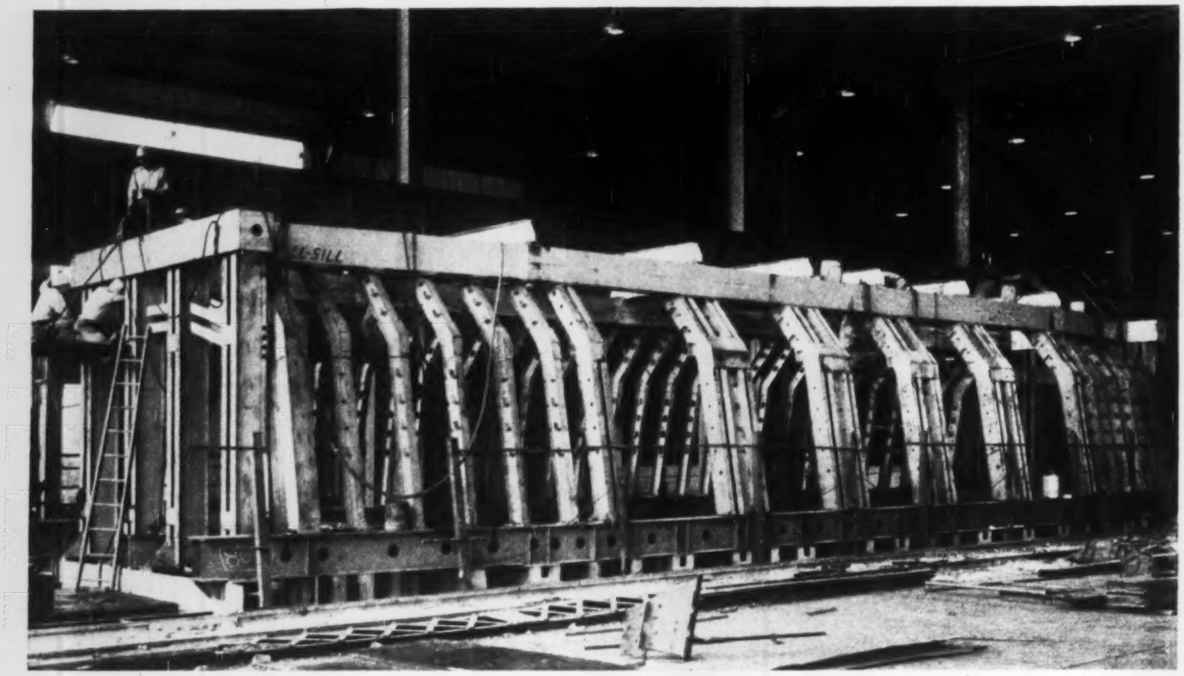
Precisely accurate due to unique mounting and 3-motor operation, Bailey Clay Guns furnish the high clay pressures (642 to 1150 psi) which are so necessary with the new coke-tar tapping hole mixes now being used on many furnaces. Designed for safety and reliability in blast furnace and large electric furnace applications, there are more than 170 in service. *Write for Bulletin.*





Clear of the tapping hole when not in use, Gun swings to the correct position for moving into the tapping hole.

WILLIAM M. **BAILEY** COMPANY · 1221 BANKSVILLE ROAD, PITTSBURGH 16, PA.



Framework of the unorthodox furnace includes a heavy steel binding around the main hearth

gineered and built by John Mohr & Sons Co., Chicago, to specifications prepared by Keystone and the Mohr company.

• The 175-ton open hearth differs in design and materials from conventional furnaces.

The furnace skeleton, made of heavy steel members, includes a hefty binding around the main hearth, which helps support the walls and roof. Front and back walls slope inward to the roof, which has a span of less than 12 ft; fewer bricks are used than in conventional furnaces.

Basic bricks are used in the entire hearth area and in part of the regenerative system.

Roof bricks hang from crossmembers that rest on the furnace frame. Refractories are also suspended from the front and back walls. The suspended construction is said to make maintenance easier.

Three checker chambers are used in the furnace vs. one or two in the conventional open hearth. (The third chamber is built into the double Isley stacks.) Greater checker capacity helps incoming air gain more heat before it enters the hearth area, reducing steel melting time.

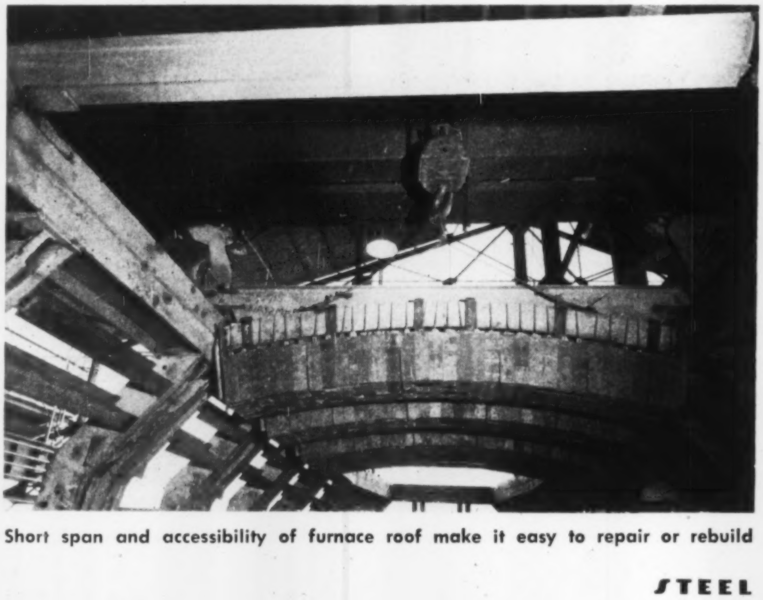
• Automatic controls make for predictable performance.

Draft, air, and instrumentation are designed to fire 125 million Btu per hour, but initial operation will be limited to 85 million Btu per hour.

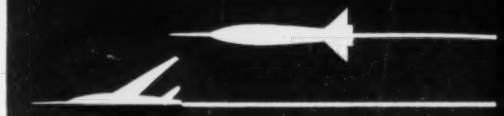
Reversal of air in the furnace is timed automatically. Instruments record checker temperatures and control heat input.

• Increased steelmaking capacity will give the company's customers better service.

The fifth open hearth will help balance Keystone's steelmaking facilities, says R. E. Sommer, president and general manager. The company's first three furnaces were built in 1917; their 75 ton capacities were later doubled. A fourth furnace was built in 1951.

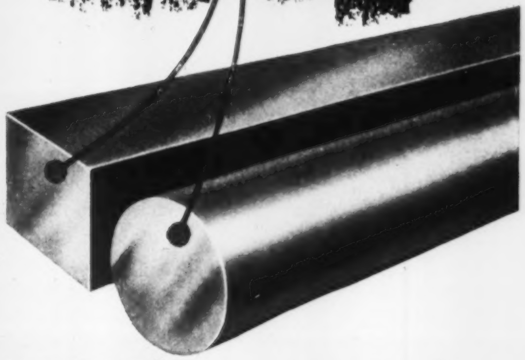


Short span and accessibility of furnace roof make it easy to repair or rebuild



For critical design applications . . .

VAC-ARC* Steels



Latrobe's know-how guarantees reliability

Production know-how gained in making highest quality tool and die steels gives Latrobe an advantage in producing VAC-ARC (consumable vacuum melted) steels to meet critical design requirements. VAC-ARC Steels possess unusual cleanliness, improved ingot structure, and superior mechanical properties.

Compare!

TYPICAL TRANSVERSE TENSILE PROPERTIES

(8″ square billet of Dynaflex)

Property	Mid-Radius		Center	
	Air Melt	Vac-Arc	Air Melt	Vac-Arc
Tensile Strength (psi)	285,000	287,000	285,000	285,000
Yield Strength .2% (psi)	250,000	252,500	245,000	250,000
Elongation %	4	8	2.5	8
Reduction of Area %	10	25	3	24

VAC-ARC
Grades Available . . .

APPLICATION	TYPE	GRADE NAME
High Temperature	A-286	Pandex
Bearings	M-50	MV-1
	52100	Regent
Aircraft & Missile	H-11	Dynaflex

Call your Latrobe representative . . . or write for literature.

LATROBE *Metalmasters* / **LATROBE STEEL COMPANY**
LATROBE, PENNSYLVANIA

BRANCH OFFICES and WAREHOUSES:
BOSTON • BUFFALO • CHICAGO • CLEVELAND • DAYTON • DETROIT
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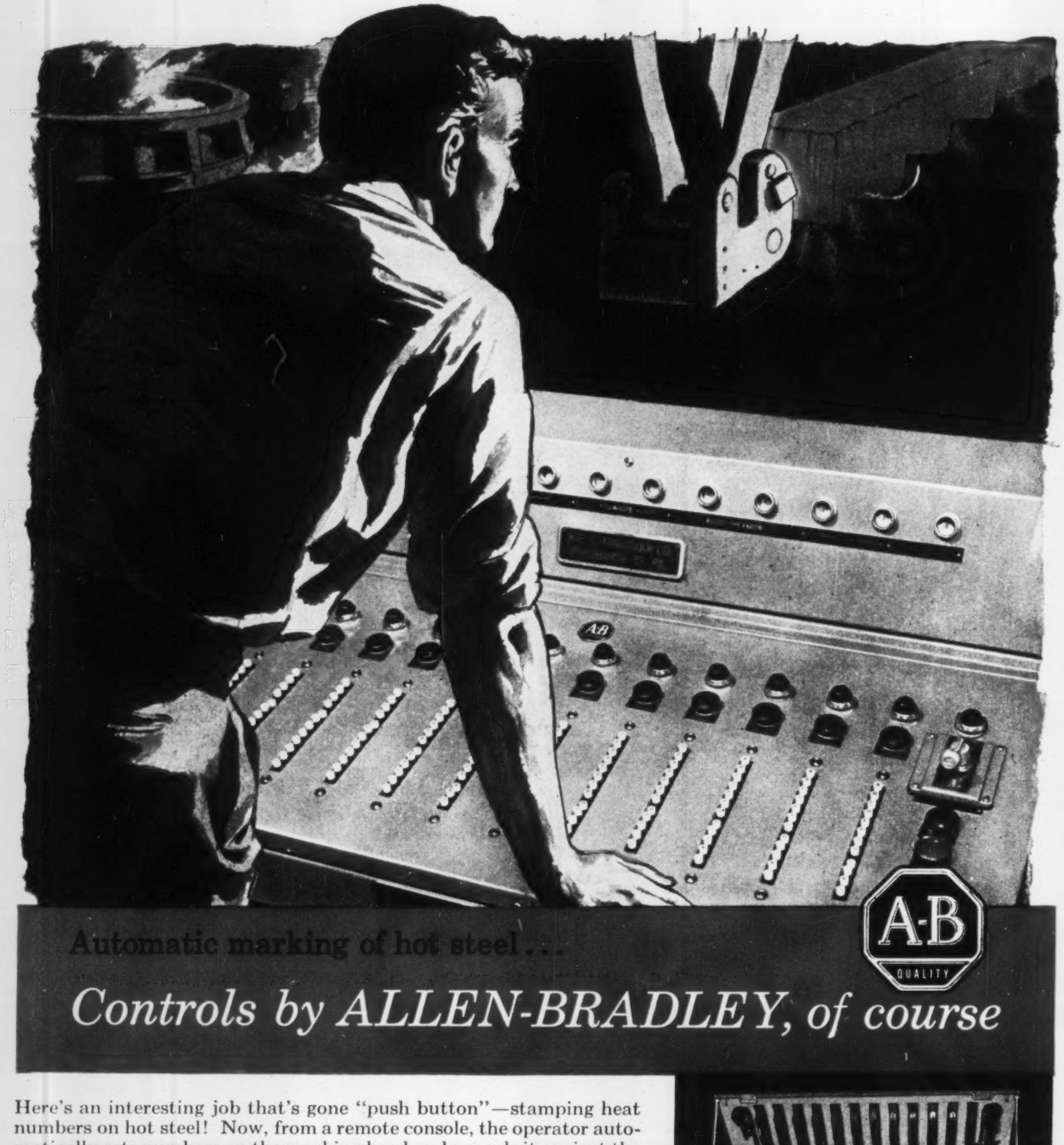
*Latrobe's Trade Name for Vacuum Consumable Electrode Melting



Automatic marking of hot steel . . .

Controls by ALLEN-BRADLEY, of course

Here's an interesting job that's gone "push button"—stamping heat numbers on hot steel! Now, from a remote console, the operator automatically sets numbers on the marking head and propels it against the steel. The controls, *of course*, are Allen-Bradley because they provide the continuous reliability that is essential to this production.

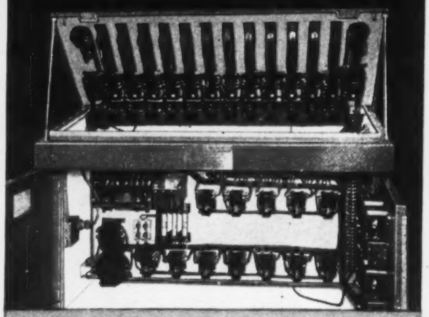
The simple, ONE moving part solenoid design of A-B starters and relays assures millions of trouble free operations. And the double break, silver contacts—used on all A-B control—eliminate costly downtime for maintenance. Keep your production lines rolling . . . insist on Allen-Bradley *quality* motor control. You cannot do better!

Allen-Bradley Co., 1320 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY

Member of NEMA

Quality Motor Control



The relays and push buttons used in the remote control console of this M. E. Cunningham Marking Machine are all standard Allen-Bradley catalog items.

Europe Leads Us in Spark Machining

The gap can be attributed mostly to skill in applying the new method—particularly to conventional production jobs. Here's an expert's report on progress to date

SPARK machining is booming in Europe, says C. Paul Porterfield, vice president, Method X Div., Firth Sterling Inc., Pittsburgh. Back from the Sixth Annual European Machine Tool Exhibition at Paris, Mr. Porterfield reports on developments in evidence at the show.

He concludes that application of the method gets more attention in Europe than it does in the U. S. Europeans also seem to have more skill at application engineering than we have. The chief difference in application trends: We have counted on the method mostly for special jobs. European engineers are beginning to use it for conventional production jobs.

• Spark machining equipment has been improved greatly in the last two years.

European builders are spending a lot of time and money to find better ways to make electrodes. Mr. Porterfield comments: "This problem is one of the most difficult faced by the spark machining industry."

Also: "Exhibitor's samples of work done by their customers indicate a marked improvement in equipment performance in the two years that have elapsed since the show at Hanover, Germany." The relatively new industry appears to be finding its niche.

• The most significant spark machining trend abroad is the production of forging dies.

Exhibitors displaying dies for such parts as crankshafts, connecting rods, steam turbine blades, motorcycle rocker arms, and wrench bodies claimed advantages in overall die production costs, uniformity of die contours, and lower die maintenance expense.

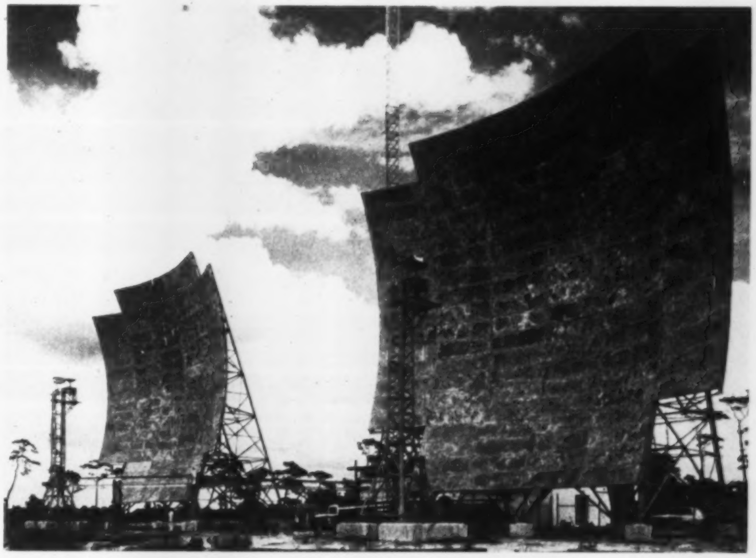
Confirming the equipment builders' claims, a representative of a major English automaker reported significant savings by his firm when it switched to spark machining of dies.

• Metal removal rates as high as a quarter of a cubic inch a minute are promised.

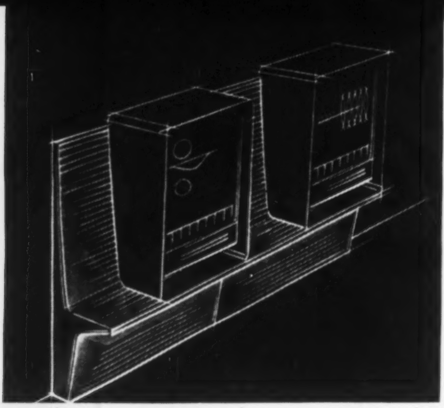
That rate involved large mechanical power generators with input ratings up to 30 kw. Mr. Porterfield reports the high speed generators do not produce a good surface finish at their maximum rate. They are intended for hogging cuts and normally evidence low rates of electrode wear.

All the generators are adjustable to provide varying rates of metal removal. The rate is reduced for finishing, and surfaces produced often require no hand polishing.

At the other end of the equipment range is a small bench type machine for the toolroom. Its maximum metal removal rate is 0.003 cu in. a minute. At the low removal range, finishes of 12 microinches were produced in steel.



ONE SET OF BILLBOARD TYPE SCATTER ANTENNAS has been erected at Cape San Blas, Fla., and a second set 180 miles across the Gulf of Mexico at Anclote Point, Fla., for high speed transmission of timing, telemetering, and radar data, and voice signal information along a missile range—the U. S. Air Force's Eglin Gulf Test Range. The antennas and feed horn towers in front of them were designed and built by Blaw-Knox Co., Blawnox, Pa. Structural steel trusses were used to form the parabola to which 12 gage curved steel plates were attached to form the antennas, which are 60 ft high



SHARONART*

a new idea in steel . . . sparks a new idea in

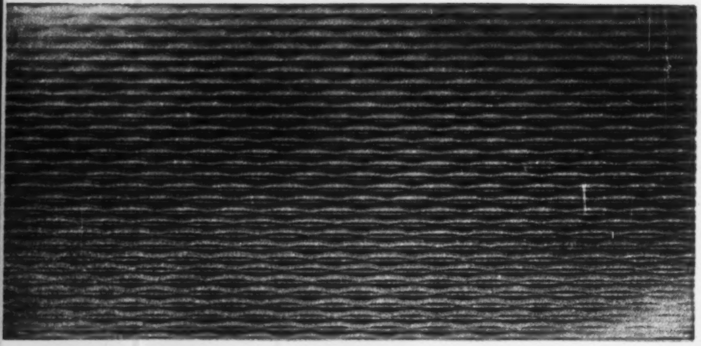
Famed designer Peter Schladermundt creates new machine concept using New Sharon Steel.

Vending machines can now stay brighter, newer, longer . . . thanks to amazing new Sharonart*.

Believing few machines are subject to the abuse received daily by the vending machine, nationally famous designer Peter Schladermundt recognized the many advantages Sharonart* would impart to this hard working equipment.

Sharonart* is patterned steel at its finest . . . and the many pattern combinations present a new plateau for the machine designer. He can now make model changes simply by altering steel patterns. But more important, Sharonart* resists marking and now vending machines will be able to absorb much more punishment without losing their attractiveness. Too, with modern painting techniques, manufacturers are able to achieve smart, new color combinations to give their product even greater beauty and sales appeal.

Wherever functional beauty and long life are desired, Sharonart* is the one perfect metal. For additional information write Sharonart, *Sharon Steel Corporation, Sharon, Pa.*



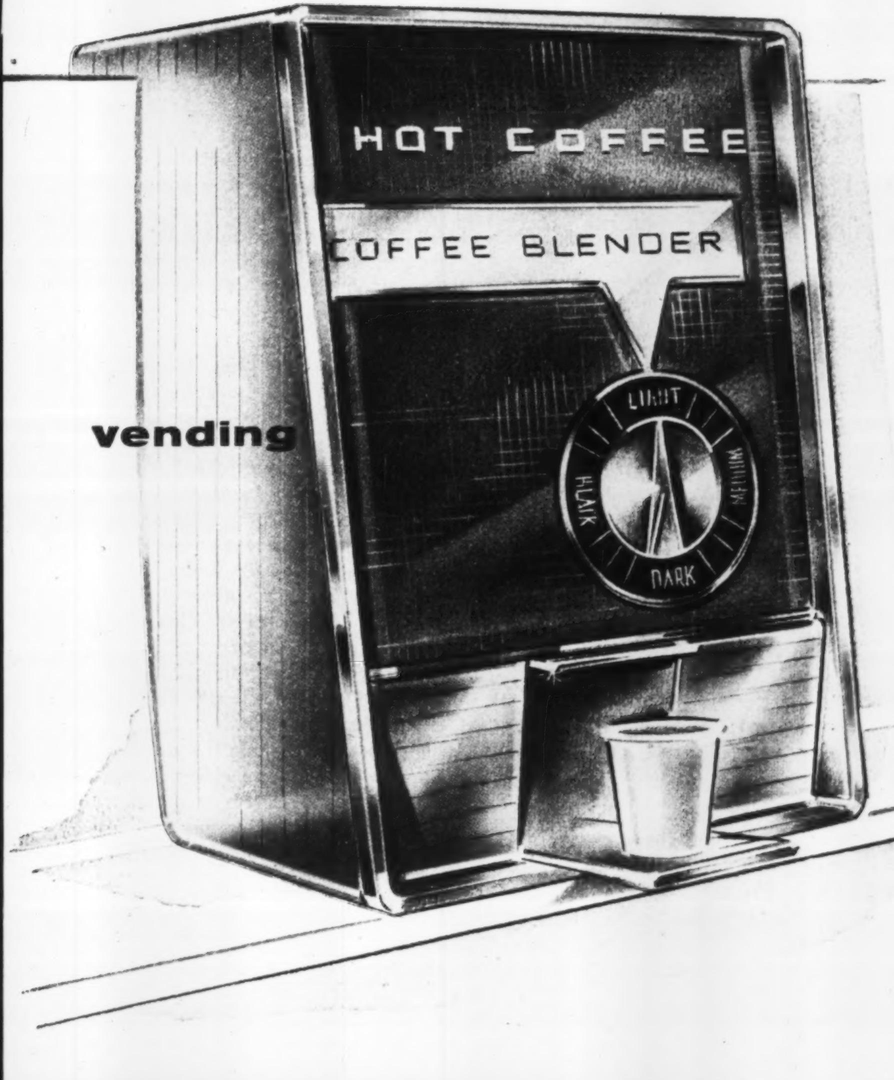
Aside from designing the vending machine of Sharonart, Peter Schladermundt has created an entire new process of machine vending. By developing special racks, machines can be easily added and removed according to demand, and/or for refilling. Rack could be made as a fixed wall type, or as an island, with machines operated from both sides. Machines could be hung individually or doubly, saddle style.*

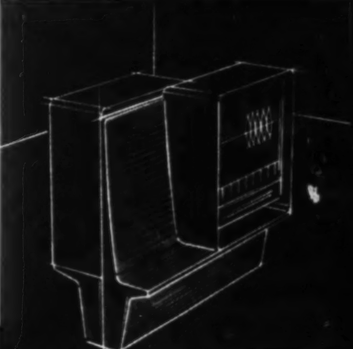
Note: The vending machine idea illustrated on these pages is not now a manufactured product. It is a design only.

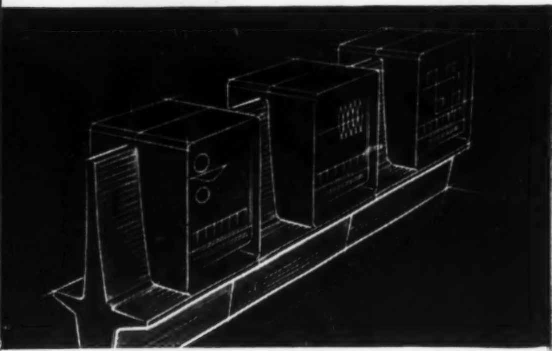
*TM

SHARON *Quality* **STEEL**

vending


HOT COFFEE
COFFEE BLENDER
LIGHT
MEDIUM
DARK
BLACK





SHARONSTEEL

Weather protection is vital for shipments of sheets chemically prepared for painting. They're wrapped in waterproof paper, covered with a rubber tarpaulin

Careful Cleaning, Storage Save Zinc Coated Sheets

Expert tells warehousemen and fabricators: Keep material dry, so it won't corrode; handle it carefully to prevent marks and scratches; clean it well before painting

ELECTRO ZINC coated sheet steel should be stored and handled carefully, so it will retain its rust resistance, says Harold H. Greene, metallurgist, Republic Steel Corp.'s Sheet & Strip Div., Cleveland. Proper cleaning before painting will make finishes last longer.

• The material should be stored in a dry place; temperature should be kept constant.

Zinc adheres well to steel; it doesn't chip or peel, even when the coated sheets are stretched or drawn. But the chemical properties that make zinc an effective corrosion barrier can lead to problems in fabrication. Example: When the zinc coating corrodes or oxidizes, it still protects the steel base, but corrosion products left on the sheets prevent proper paint adherence.

Stored sheets should be protected from the weather, but it's also important to keep temperature constant. Moisture, produced by condensation on the outside of a stack of sheets, is drawn to the center by capillary action. Corrosion results.

If the sheets could be separated to insure air drying of accumulated moisture, corrosion couldn't form. But such storage isn't practical.

• Sheets must be handled carefully, to avoid finger marks, dents, or scratches.

The material doesn't require special protective covering, but handling should be kept to a minimum. Finger and hand prints can't damage the zinc surface but may cause paint, applied later, to peel or blister. Workmen wearing clean gloves won't mark the material.

Some zinc coated sheets, prepared at the mill for painting, aren't easily damaged. But any flat rolled sheets will be scratched or dented if they are abused. And glossy paint makes dents or scratches more noticeable. Most surface damage can be avoided if proper lifting and handling methods are used.

The sheets are suitable for stamping, bending, or other forming methods. The rules followed in handling should be observed in fabrication. The sheets should be handled flat when possible.

Shearing and blanking leave raw edges that can corrode if they're not painted. Resistance welding doesn't seriously reduce corrosion resistance of the material. But gas and arc welding may burn off the zinc coating in the welded area. In that case, some protection should be applied to the surface.

• Electro zinc coated products must be cleaned thoroughly before they are painted.

The material can be cleaned effectively with sprays of alkalies or emulsions, diluted with water. But sprays can't always be used. Example: A maker of mobile homes might find hand wiping more practical.

Cloths and solutions used for hand wiping must be clean for good results, and the solution should be chosen carefully. Tests in Republic Steel's laboratories show that a mixture of mineral spirits, alcohol, water, and chromic acid is most effective for removing oil or water soluble marks. The chromic acid also serves as a final conditioner on surfaces that have been chemically prepared for painting.

Design Analysis Pays Off for Ex-Cell-O

THE COST CRISIS . . . How to Beat It

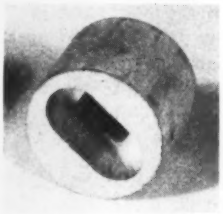
Committee approach is used on many cost cutting problems. Restudy, item by item, brings major changes in materials and methods. Over-all costs are often cut 15 per cent

PLUGGING small leaks in an otherwise "efficient" system can add up to big savings, reports Ex-Cell-O Corp., Detroit.

The slow, tedious solving of problems one at a time wasn't fast enough or effective enough to keep abreast of market trends, labor increases, new product development, or increases in demand which boosted production needs 26 per cent in one year. So the firm established a cost analysis group which was able to handle a larger volume of problems and set up a training program to develop the skill of designers and increase process knowledge.

Results: Production and quality have improved significantly; often, a complete product is made for 15 per cent less.

The Ex-Cell-O people showed STEEL 18 examples of their prowess in cutting costs and improving designs. Here are four which represent results the cost analysis group is getting:



SPECIAL WRENCH
Saved 30 per cent

New: Make in one piece from SAE 1030 mild steel by drilling a slot and a square hole.

Old: Braze weld a hexagonal insert to head part on a standard, purchased socket wrench made of alloy steel.

GIB—Saved 48 per cent

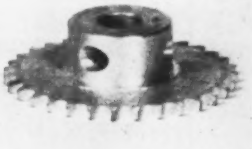
New: Machine a steel piece with a laminated brass wear surface.

Old: Machine from solid brass.

RAIL—Saved 44 per cent

New: Change material to an electrolytic grade of stainless and polish electrolytically to eliminate the hand operation. Remove the notch.

Old: Cut a notch in a stainless steel bar and hand polish to a #4 finish.



SPROCKET
Saved
77.5 per cent

New: Change to carbon steel; use two pieces with welded hub; induction harden teeth.

Old: Make from an alloy steel forging and heat treat.

To the Executive
who watches his Competition closely . . .

Are you investigating Clad-Rex® Vinyl-Metal Laminates?

Don't wait *too* long! Because Clad-Rex really reduces manufacturing costs *and* increases product sales appeal. And *that* kind of advantage would be better yours than your competitor's. Many other manufacturing executives are already using Clad-Rex vinyl-metal laminates for electronic equipment cabinets . . . automotive trim . . . appliances . . . furniture, etc.

Here are the facts:

Clad-Rex is a calendered, semi-rigid poly-vinyl chloride film laminated to sheet metal. All alloys and tempers of aluminum and steel (including galvanized and aluminized) are commonly used. Other metals can be used where their special properties are important to end product performance.

The most obvious advantage of Clad-Rex vinyl-metal laminates is styling. It's unlimited! Simulated woodgrains and leathers as well as a wide variety of colors and textures in sparkling burnishes (including high metallics), or non-reflective matte finishes. You can design your own if you prefer!

Not so obvious, *but most important of all*—Clad-Rex vinyl-metal laminates are practical. There is no complex technique or special tooling required to fabricate Clad-Rex. It can be fabricated in almost as many ways as any *un*-finished sheet metal. Furthermore, and without charge, a Field Fabricating Engineer is provided to show your production people how easy it is to get into production with Clad-Rex.

Actually, Clad-Rex *simplifies* your manufacturing operations. It's finished before you get it. Movement of sub-assemblies, etc., through your plant becomes more direct—out of your dies into assembly.

Clad-Rex lowers your end product cost. Although Clad-Rex costs more than *un*finished metal coming into your plant, elimination of expensive handling and finishing adds up to *less cost* when your product is ready to ship. Clad-Rex resistance to abrasion often eliminates the rejects common to *un*finished or other pre-finished metals. This includes the costly efforts to salvage those rejects, too.

Your product may need these other characteristics of Clad-Rex vinyl-metal laminates—high dielectric strength, and resistance to the corrosion of acids, alkalis, and household detergents.

So, see for yourself. Write for details. No obligation, of course. Perhaps you won't be first in your field to begin using Clad-Rex. But why risk competitive disadvantage by being last?

VINYL-METAL LAMINATES BY **CLAD-REX** DIVISION OF SIMONIZ COMPANY

2105 Indiana Avenue • Chicago 16, Illinois
Telephone: VIctory 2-7272

3-A

Press Offers 6 Minute Die Change

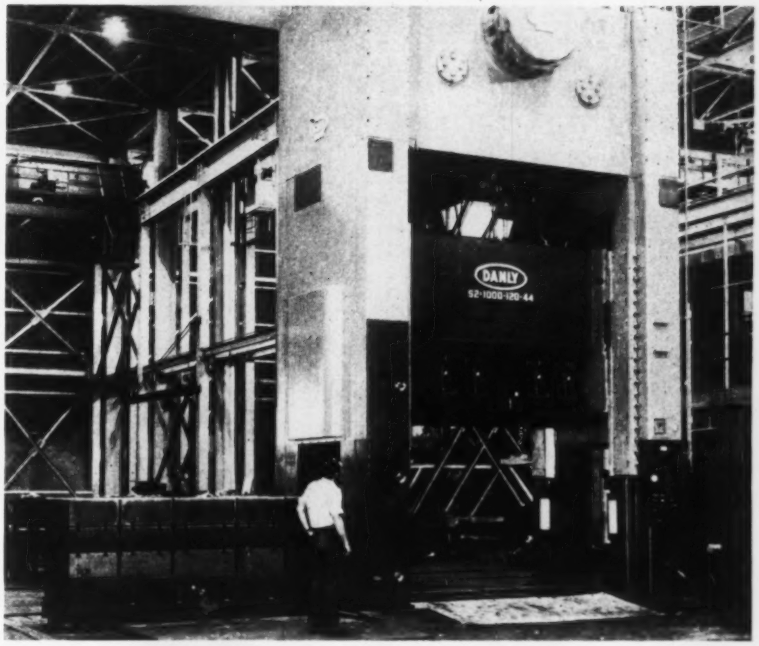
DIES can be changed on this press in 5 or 6 minutes. The quick change feature permits better scheduling of production runs to hold down in-process inventories.

The company says that where the press has replaced older equipment as much as 40 per cent production time has been gained.

The unit is a 1000 ton, single action, two point press with a 120 x 44 in. bed area. Self-propelled bolsters are controlled from the master control panel. Electrically controlled automatic die clamps are used.

Other features include automatic slide positioning, a hydraulic overload device, a tonnage indicator, and locking cushions with pulldown for retarded stripping action and automatic nesting of parts.

For further information, *write* Danly Machine Specialties Inc., 2100 S. Laramie Ave., Chicago 50, Ill.

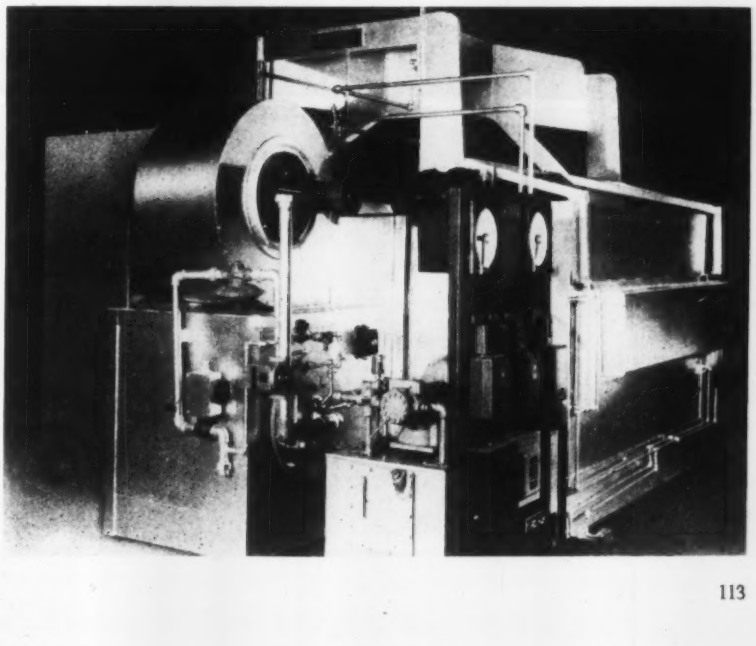


Heat Treating Furnace Flattens Steel Sheets

THIS FURNACE flattens steel sheets during heat treating. It's a circulating type. Doors open in front and back so the furnace can be used at both ends. Inside are two cast iron dies. The bottom die is stationary; the top die is mounted to a hydraulic cylinder with a ball joint.

Flattening occurs during tempering or precipitation hardening. The company can supply several control combinations. Furnace temperature can be held to ±5° F in a range between 250 and 1100° F. Gas fired or electrically heated models are available.

For further information, *write* Dept. 9, Waltz Furnace Co., 1901 Symmes St., Cincinnati 6, Ohio.



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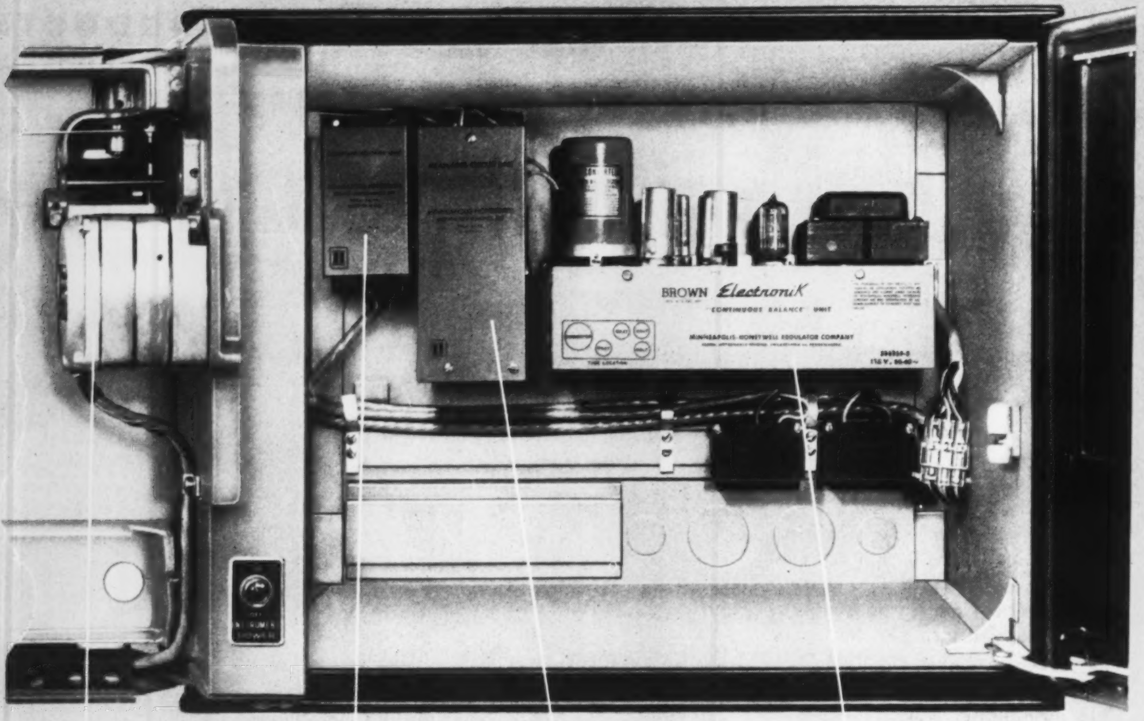
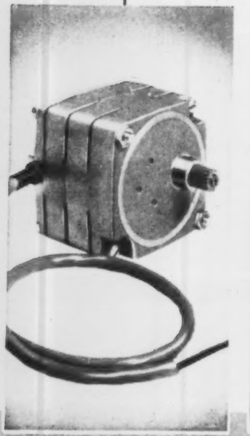
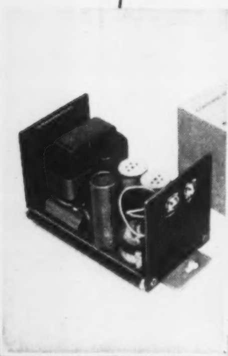
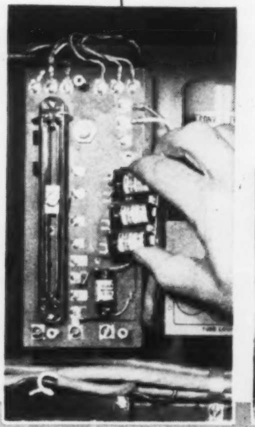

BROWN ElectroniK
"CONTINUOUS BALANCE" UNIT
MINNEAPOLIS-HONEYWELL REGULATOR COMPANY



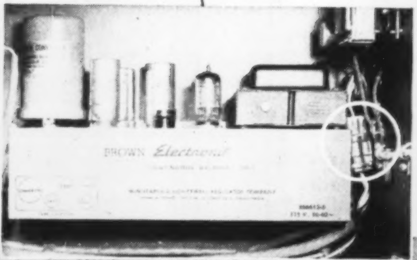
Servo Motor has sectional housing, leakproof oil wick, printed circuits for simplified servicing. Any major part can be replaced in 2 minutes.



Constant Voltage Module—Uses Zener diodes and an ambient temperature compensator to replace standardizing mechanism.



Measuring Circuit Module—Contains easily-changed range spool panels and vernier adjustment. Range is changed simply by replacing screw-clip panels of fixed resistors.


BROWN Electronik

Amplifier Module—Quick-connect design permits fast, easy removal for servicing and replacement. Circle shows quick connect plug.

THESE FOUR NEW FEATURES ARE STANDARD WITH ALL *ElectroniK* POTENTIOMETERS

New modular design...

makes *ElectroniK* potentiometers easier to use and maintain

Now, four great new features add new operating and servicing ease to all *ElectroniK* circular and strip chart potentiometers.

- **New servo and chart drive motors are sectionalized so that any major part can be replaced in two minutes.**
- **A new constant voltage unit replaces batteries, standard cells and standardizing mechanisms.**
- **A new measuring circuit, with quick-change range spools, simplifies range changing and reduces stray pickup.**
- **A quick-connect feature lets you remove the amplifier for service and replace it quickly.**

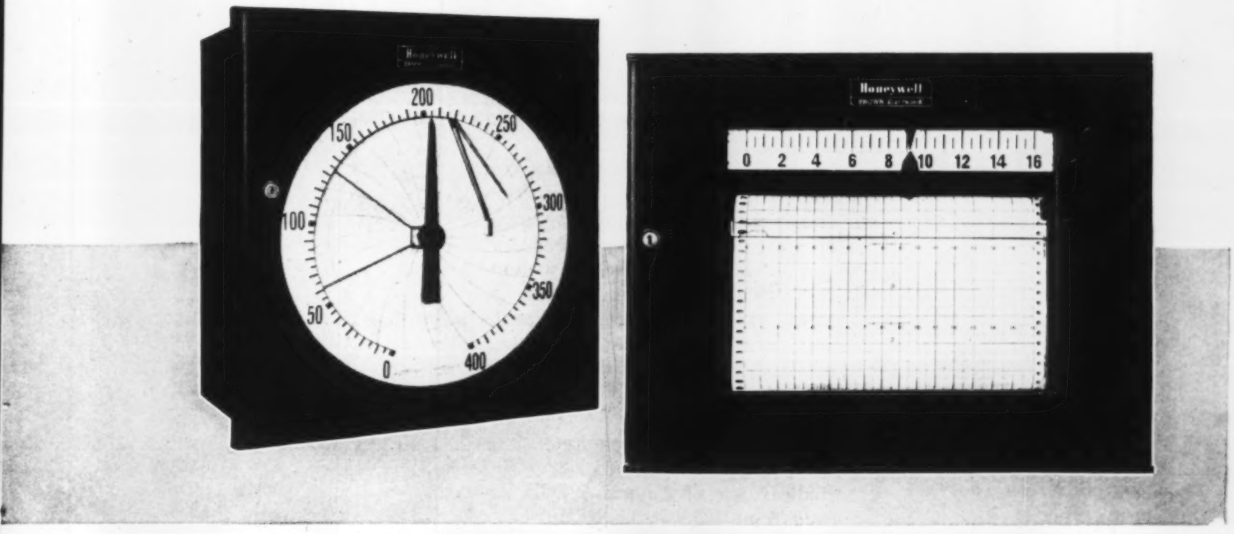
Now, modular design is combined with the traditional precision of *ElectroniK* potentiometers, to give you a greater value than ever in accurate, dependable measurement and control.

For full details, call your nearby Honeywell field engineer today. He's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

H HONEYWELL *First in Control*



Splined Milling Cutters, Arbors, Cut Faster, Better

SPLINED milling arbors and cutters made by Pratt & Whitney Co. Inc. are reported to have increased metal removal rates 92 to 400 per cent. Cutter life is also increased. Other benefits include minimized distortion, increased positioning accuracy of the cutter, and a better milling finish.

The splined construction is designed to increase resistance to torsional deflection of the assembly (spacers and flywheels are splined too).

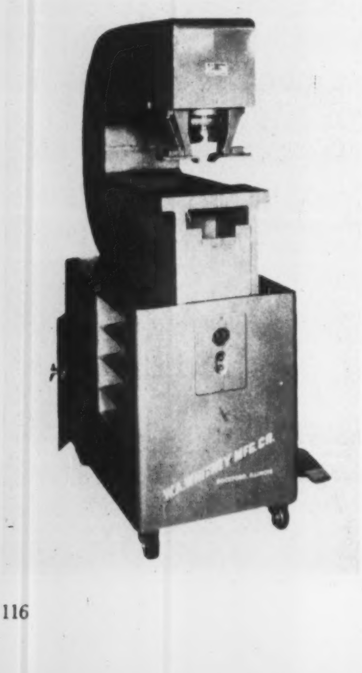
For further information, *write* Pratt & Whitney Co. Inc., Charter Oak Blvd., West Hartford 1, Conn.

Punch Press Available In Two Throat Depths

THIS new cabinet mounted punch press is available with a 12 or 24-in. throat depth. Capacities include: 4 in. through 3/32 in. mild steel (using standard round punch and die sets) and $2\frac{1}{2}$ in. (with standard square punch and die sets).

Adjustable strippers accommodate all sizes of punch and die sets up to maximum size. A large clamp bar arrangement is used for more positive holding of punches. They're available with either $1\frac{1}{2}$ or 3 hp, 1800 rpm motors (220/440 volts).

For further information, *write* W. A. Whitney Mfg. Co., 636 Race St., Rockford, Ill.



PLASMA FLAME SPRAY GUN applies coatings of high melting point materials at 10,000 to 15,000° F. The unit can spray materials such as zirconium carbide, tungsten, tungsten carbide, and other carbides, oxides, and borides. The maker says coating densities are easy to control. For further information, **write** Metallizing Engineering Co. Inc., 1105 Prospect Ave., Westbury, N. Y.

Electronic Gaging Modules Solve Complex Problems

STANDARD electronic modules can be assembled into automatic or semiautomatic high speed inspection systems for simple or complex dimensional measurements. They're suitable for applications in automatic hardness testing, self-compensating grinder controls, valve and spring testing, and inspection of ball and roller bearings. Accuracy is in the millionths, says the maker.

The units can be used in a number of different combinations to solve complex measurement problems and to actuate segregating, marking, and stamping devices. Components or complete systems can be supplied.

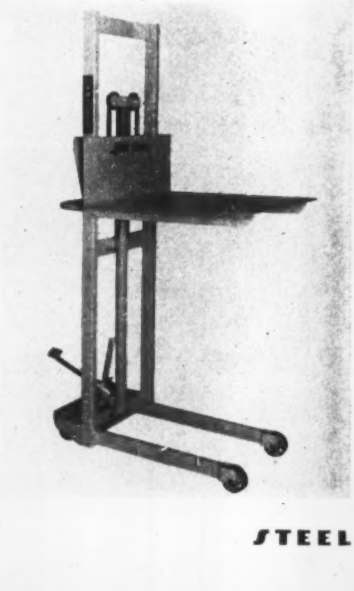
For further information, *write* Industrial & Automation Div., Radio Corp. of America, 12605 Arnold Ave., Detroit 39, Mich.

Utility Lift Truck Rated for 750 lb Loads

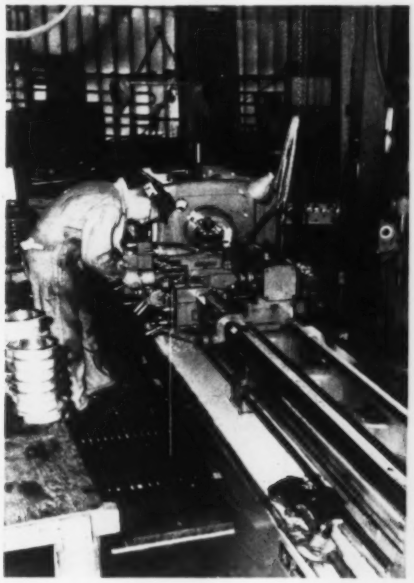
A MOBILE, foot powered hydraulic lifter and transport truck can lift up to 750 lb (1000 lb test) loads 64 in. above floor level.

A hydraulic system is used to hold the load. Clothing catching lift handles and open gears have been eliminated. Optional equipment in-

(*Please turn to Page* 121)



Here, a slip joint collar is being turned and bored from a T-6 aluminum blank. Floor-to-floor time is only 25 minutes, a 30% saving in time alone.



even an engine lathe can have an impressive record of savings if it's a LODGE & SHIPLEY POWERTURN

records show $2000.00 annual saving . . . 30% on a typical operation

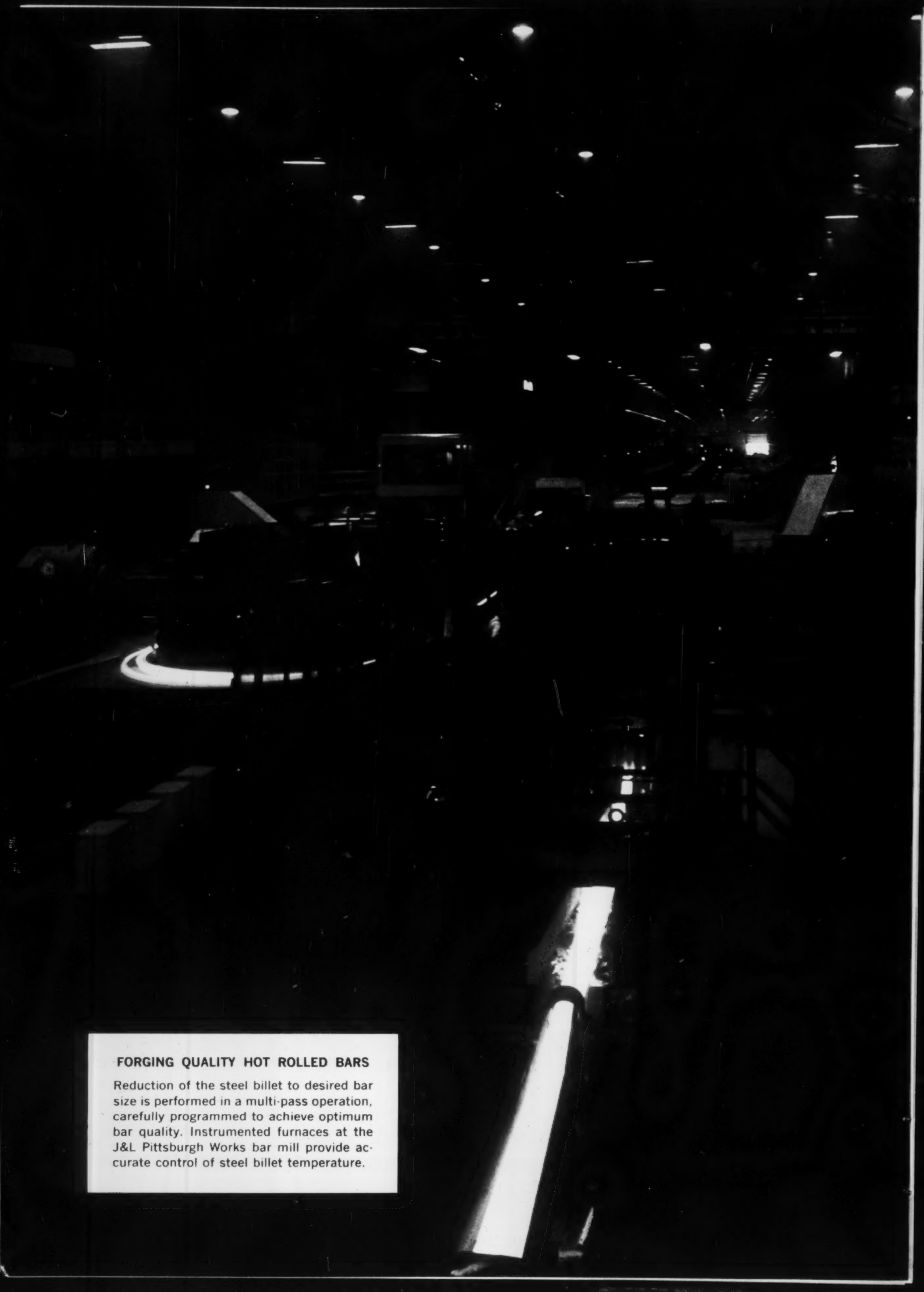
Significant savings are nothing new on production type lathes but it is something to write home about on an engine lathe. Tacoma Boatbuilding Co., Inc., Tacoma, Washington, liked the accuracy, versatility and output of their POWERTURN Lathe . . . found impressive savings even when this engine lathe was used for non-repetitive operations.

Whatever your turning requirements, consider Lodge & Shipley. Your needs can be filled precisely from a complete range of sizes and types . . . Production, Engine, Toolmaker, Gap, Hydraulic Tracer Controlled and Right Angle Chucking Lathes . . . all designed to provide the best machine for a specific job.

Check Sweet's Machine Tool File, your telephone book Yellow Pages or write direct for literature: **The Lodge & Shipley Company, 3070 Colerain Ave., Cincinnati 25, Ohio.**

Your Lodge-*ical* choice . . .

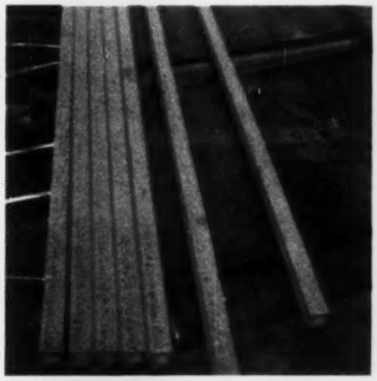
Lodge & Shipley



FORGING QUALITY HOT ROLLED BARS

Reduction of the steel billet to desired bar size is performed in a multi-pass operation, carefully programmed to achieve optimum bar quality. Instrumented furnaces at the J&L Pittsburgh Works bar mill provide accurate control of steel billet temperature.

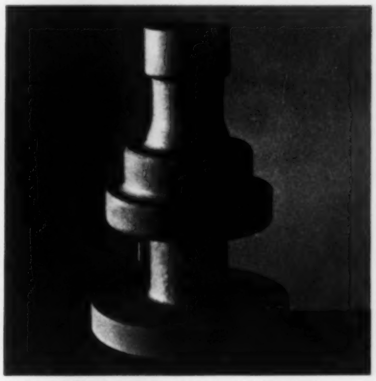
Hot flame scarfer removes surface imperfections from the bloom to assure top quality steel billets, basic raw material for the bar mill.



3″ x 3″ steel billets emerge from the billet mill to this cooling bed where they are tested by J&L metallurgists for product uniformity.

Forging quality hot rolled bars leave the bar mill on this runout table. They are inspected for accuracy of section.

Refrigerator cam shaft, forged from a 57/64″ coarse grained C-1117 square, has a perfect balance of properties for long, hard usage.

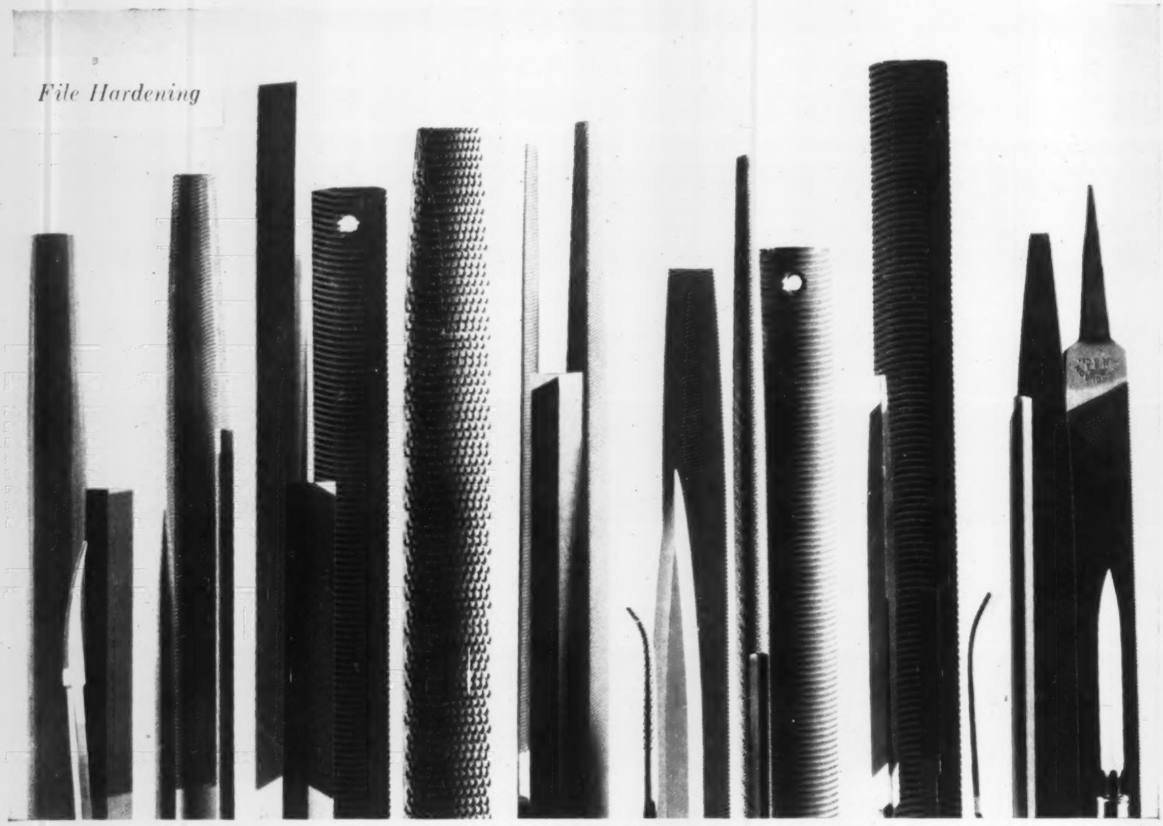


Automobile transmission part, forged from a 2¼″ round, has exact balance of properties that helps reduce production cost. AISI Grade 4027.

Automobile steering knuckle support is forged from 1-15/16″ J&L round. AISI Grade 1340.

J&L Forging Quality Hot Rolled Bars are carefully detailed for precise balance of chemistry and physical properties to meet your special requirements. As an integrated producer, J&L combines control of raw materials with the special facilities and successful production experience that are necessary **to provide exactly the right forging quality steel for any application.** A field staff of J&L metallurgical consultants will work with you to determine the steel which will best serve your particular requirements for forging, machining and end product use. The consultant then works directly with the J&L mill to obtain a forging steel that **is tailor-made for your operation.** Simply call your local J&L district office for a preliminary discussion, or you may write directly to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin Steel Corporation
PITTSBURGH, PENNSYLVANIA



Nicholson File Co.: Many thousand files are hardened daily; Speedomax control helps keep rejects to absolute minimum.

Control of lead pot temperatures a problem?

Not at Nicholson File Co., Anderson, Ind., where Speedomax® H controllers are holding critical hardening temperatures to within ±5 F. With file hardening an art, Speedomax H permits a skilled operator to devote all his attention to producing a hard, straight, undistorted file. Since installing automatic control, *rejects have been minimized . . . pot life has increased substantially . . . new-operator training time appreciably reduced.* Rugged, compact and completely reliable, Speedomax H is providing similar process benefits on numerous other heat treat operations . . . is helping both to modernize production and to produce a quality product. Whatever your heat treat, it'll pay you to investigate Speedomax H! For details, contact your nearest L&N office or write 4957 Stenton Avenue, Philadelphia 44, Pennsylvania.

With automatic control holding pot temperatures to within ±5F, skilled operators can devote all their attention to producing files which consistently meet maximum hardness and straightness specs.

LEEDS NORTHRUP
Instruments · Automatic Controls · Furnaces

(*Concluded from Page* 116)

cludes a floor lock, floor protective wheels, and pipe runners to help in truck loading. A battery powered unit (Model BHD) is also available.

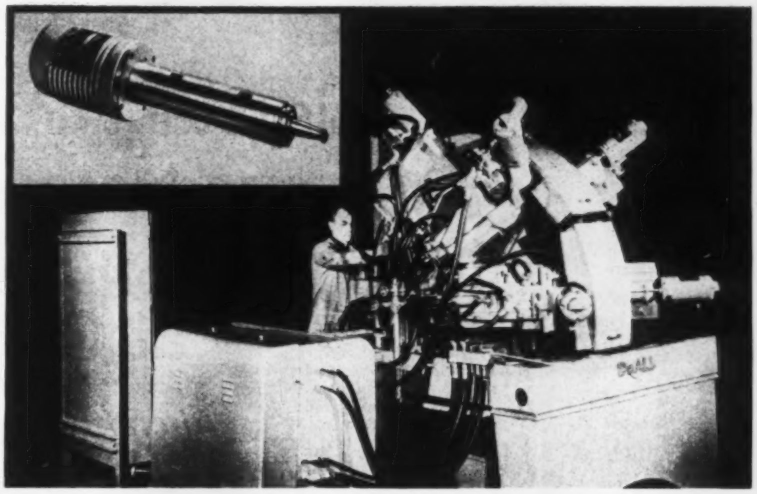
For further information, *write* Langley Mfg. Co. Inc., 913 Cambridge St., Cambridge 41, Mass.

Self-Coiling Air Hose Ends Line Entanglements

A SELF-STORING air hose eliminates the need for a reel. It's designed for portable air tools and hoists. Typical uses: Compressed air lines to grinders, wrenches, nut setters, and rivet guns.

It has a microfinished bore and full flow, nonflared fittings for unobstructed air flow at pressures up to 200 psi. Maximum working length is about 20 ft. Coiled length is under 1 ft.

For further information, *write* Synflex Products Div., Samuel Moore & Co., Mantua, Ohio.



Tool Spindles Come in Three Models

A LINE of spindles developed for use in DoAll precision surface grinders has been made available to fill the needs of most original equipment manufacturers and replacement users. Three models are available: 3 in. OD, belt driven; $1\frac{1}{2}$ hp, 3 in. OD, motorized; and 1 hp, 3 in. OD, motorized. Six spindles are utilized on the machine illustrated.

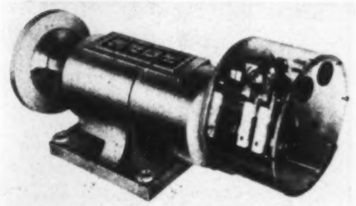
The motorized units operate at 3450 rpm and are recommended for wheel sizes up to 7 x $1\frac{1}{4}$ x $\frac{1}{2}$ in. or 8 in. for wheels with bonds rated for higher than normal peripheral speeds. The belt driven unit can carry larger wheels with the pulleys arranged for the proper rpm or smaller wheels at spindle speeds up to 5000 rpm.

For further information, *write* DoAll Co., 256 N. Laurel Ave., Des Plaines, Ill.

Precision Spindles Do Electrolytic Grinding

SPINDLES for electrolytic grinding may be motor or belt driven and are available in 1 to 20 hp with speeds of 900, 1200, 1800, or 3600 rpm. They are supplied to operate at 50 to 3000 amperes.

The units have built-in insulation and are equipped with a fork type, cool operating brush assembly for transmitting low voltage amperage current to the grinding wheel.



For further information, *write* Pope Machinery Corp., Haverhill, Mass.

High Production Presses Have Sensitive Control

A WIDE range of compact, self-contained presses have been designed for sensitivity to delicate straightening with maximum reliability for heavy broaching, riveting, forcing, marking, swaging, or complex special applications. Production, quality, and efficiency have been improved, says the company.

Smoothly variable press speeds and controlled fluid power help provide sensitive control of ram speed, force, travel, and direction of movement through each phase of operation. Automatic and semiautomatic electrical controls are also available. Available press sizes: 2 tons to several hundred tons.

For further information, *write* Detroit Broach & Machine Co., Rochester Road at Avon, Rochester, Mich.

Taps on Portable Welder Range 60 to 180 Amperes

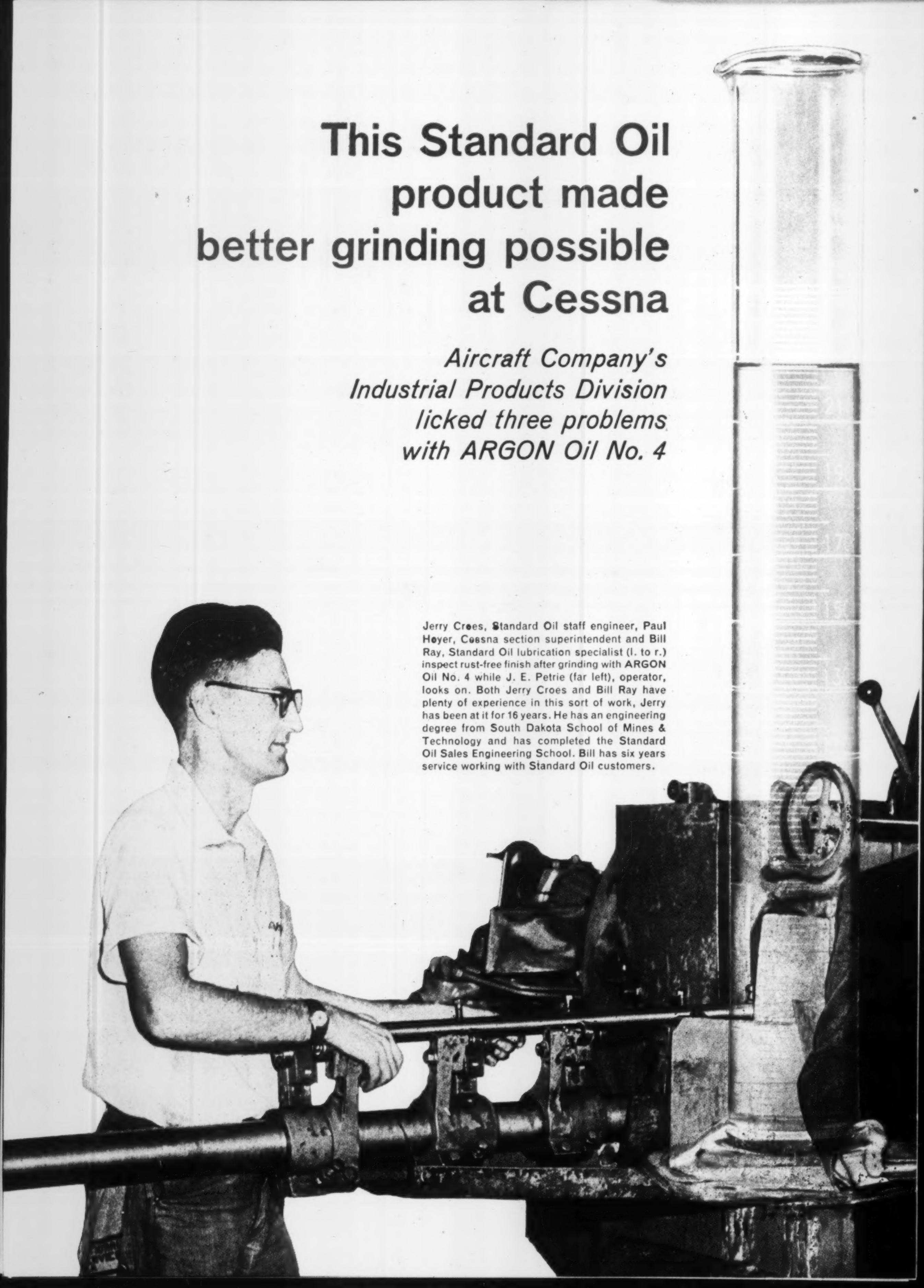
A PORTABLE 180 ampere welder (called Portarc) is suitable for on-location welding, brazing, soldering, and heating jobs. The unit has a guaranteed output (78 open circuit voltage with 75 per cent power factor) that gives ultimate performance from six heat taps (60 through 180 amperes).

All units carry NEMA ratings,

(*Please turn to Page* 124)

This Standard Oil product made better grinding possible at Cessna

Aircraft Company's Industrial Products Division licked three problems with ARGON Oil No. 4



Jerry Croes, Standard Oil staff engineer, Paul Hoyer, Cessna section superintendent and Bill Ray, Standard Oil lubrication specialist (l. to r.) inspect rust-free finish after grinding with ARGON Oil No. 4 while J. E. Petrie (far left), operator, looks on. Both Jerry Croes and Bill Ray have plenty of experience in this sort of work, Jerry has been at it for 16 years. He has an engineering degree from South Dakota School of Mines & Technology and has completed the Standard Oil Sales Engineering School. Bill has six years service working with Standard Oil customers.

Situation: A fluid used in grinding operations at this Cessna plant at Hutchinson, Kansas, was creating three problems:

1) It washed the lubricant from regulator wheels and grinding fixtures, causing them to freeze.
2) It caused build-up of deposits.
3) It stripped paint from machine surfaces.

What was done: Cessna management called in a Standard Oil lubrication specialist who recommended ARGON Oil No. 4 in ratios of 100 and 150:1 for test. The coolant was tested in two centerless grinders for two months.

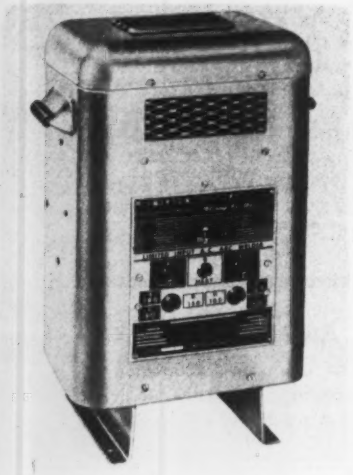
What happened: All three conditions which were hampering operations were cleared up when the switch was made to ARGON Oil No. 4. Cessna also found that work remained rust-free after passing through the machines, something that had not been the case before. They also found that the coolant didn't foam. With no foam, more of it stayed on the wheel, resulting in cooler operation. Faster cuts were obtained with finer wheels. All 12 grinders in the Cessna shop were then converted to ARGON Oil No. 4.

What you can do: Get more facts about ARGON Oil No. 4 from the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago 80, Illinois.**

Quick facts about **ARGON Oil No. 4**

• Clear, transparent fluid • Able to control corrosion and rust on work and machines • All chemical. Does not support bacteria growth • Unaffected by humidity • Fire resistant • Odorless

You expect more from **STANDARD** *and you get it!*



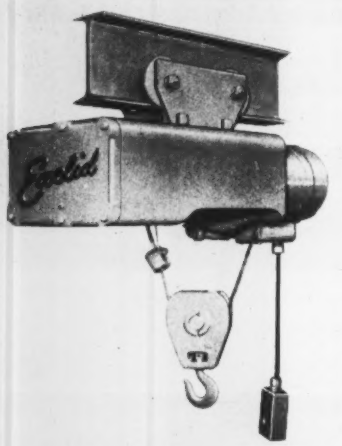
(*Concluded from Page* 121)

UL listing, and CSA and REA approval. The unit weighs 68 lb and measures $21\frac{3}{4}$ x $14\frac{1}{4}$ x 10 in.

For further information, *write* Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 36, Mo.

Electric Hoists Feature Wide Capacity Range

THE Series S Electric Hoist uses a one piece gear housing and a heavy steel frame to eliminate misalignment or oil leakage. Motors are interchangeable (any standard NEMA D, flange mounted Series 180 or 210 with an integral disc brake).



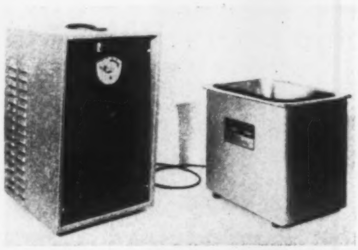
The unit is designed for easy service and accessibility of key parts. You can get capacities of 500 to 12,000 lb.

For further information, *write* Euclid Crane & Hoist Co., Chardon Road, Cleveland 17, Ohio.

Ultrasonic Cleaner Has Average Energy Levels

AVERAGE energy levels are provided by the Model 120 ultrasonic cleaner. The unit has a 2 gallon tank made of heavy gage polished stainless. Corners are deep drawn and rounded to facilitate rinsing out contaminants. Driving elements cover 27 per cent of the tank bottom. Actual radiating surface is 24 sq in.

The generator (115 volts, single phase, 60 cycles) is designed for continuous operation. It delivers an average 125 watts with peaks of 500 watts. Features include a one tube oscillator, front panel switching between two transducers, and three wire ground protection. The unit can be adjusted to available line voltage. It's interlocked for operator safety.

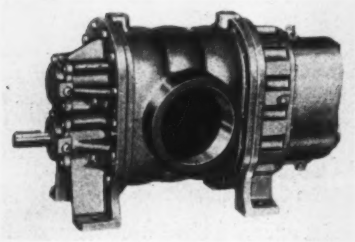


For further information, *write* National Ultrasonic Corp., 111 Montgomery Ave., Irvington 11, N. J.

Vacuum Blower Line Comes in Ten Sizes

TEN sizes of small volume vacuum blowers are designed for capacities from 30 to 1000 cfm and vacuum to 20 in. Hg in single stage applications. They may be compounded for vacuum service over 20 in. Hg.

Major features include elimination of internal valves, absence of contact between moving parts, freedom from maintenance, maximum efficiency of rotor design and operating speeds, and minimum sealing water requirements. At reduced vacuums, these units may be operated in some applications without sealing water.



For further information, *write* Roots-Connersville Blower Div., Dresser Industries Inc., 900 W. Mount St., Connersville, Ind.

Grinding Discs, Belts Are Sharper, Last Longer

A LINE of resin bonded aluminum oxide coated abrasives called Metalite Type 101 has improved sharpness and cutting life. You can get fiber discs in a grit range from 150 through 24 and cloth belts from 180 through 24. Shedding is kept to a minimum.

For further information, *write* Behr-Manning Co., a division of Norton Co., 356 Howe St., Troy, N. Y.

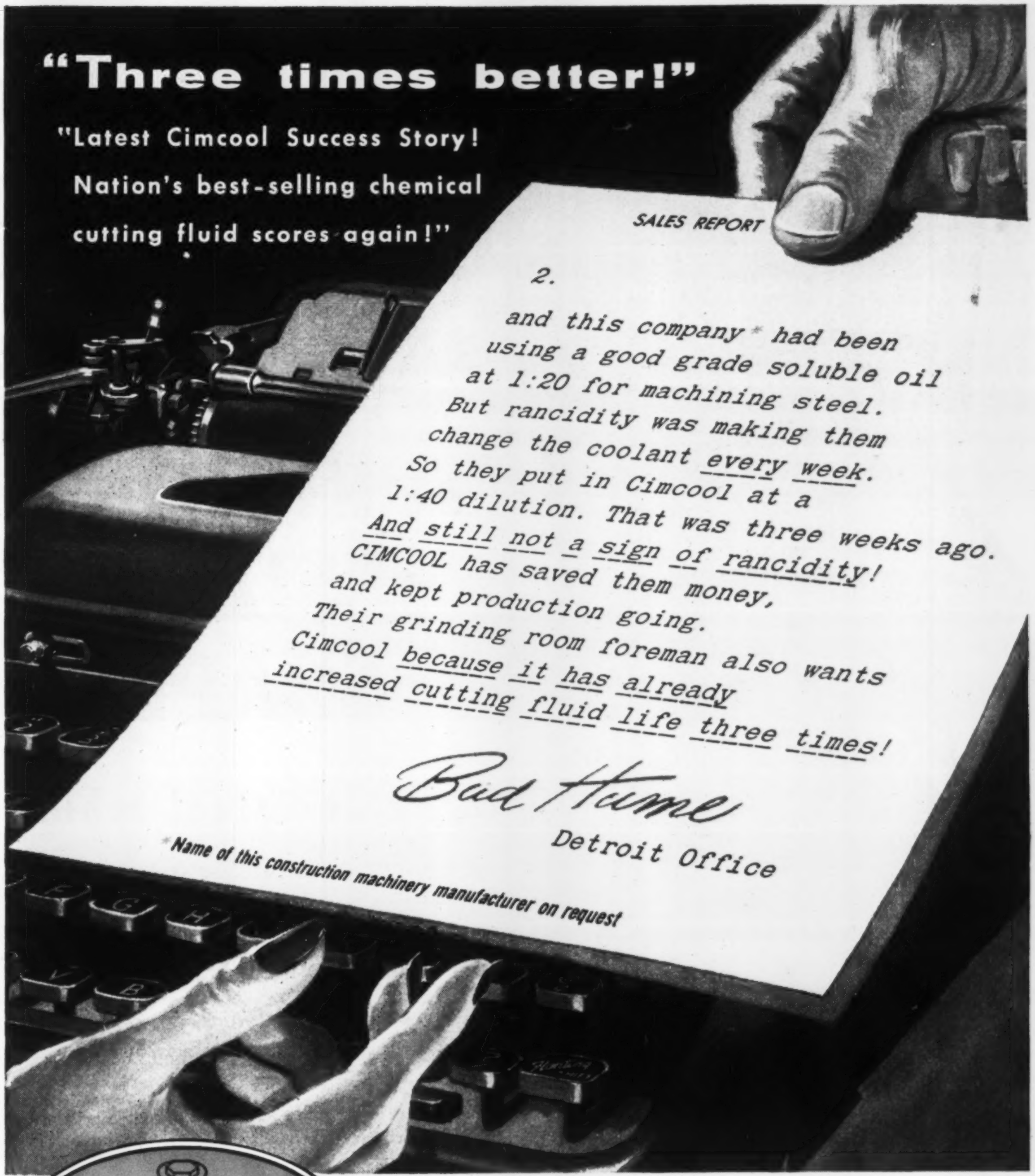
Box and Pan Brake Bends Sheets Up to 16 Gage

THE PX-24 Box and Pan Brake (24 in.) can bend sheet metal up to 16 gage. The flip-over gage gives positioning up to 24 in. without reversing or removing the gage bar.

A stop collar is adjustable up to 135 degrees. An adjustable friction brake lock stops upper bar, dead weight drop. Fingers are arranged to form $\frac{3}{4}$ to 24 in. in $\frac{1}{4}$ in. in-

"Three times better!"

"Latest Cimcool Success Story!
Nation's best-selling chemical
cutting fluid scores again!"



SALES REPORT

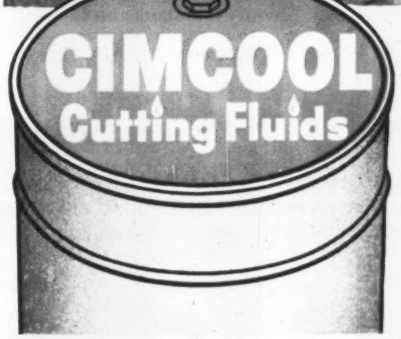
2.

and this company* had been using a good grade soluble oil at 1:20 for machining steel. But rancidity was making them change the coolant every week. So they put in Cimcool at a 1:40 dilution. That was three weeks ago. And still not a sign of rancidity! CIMCOOL has saved them money, and kept production going. Their grinding room foreman also wants Cimcool because it has already increased cutting fluid life three times!

Bud Hume

Detroit Office

*Name of this construction machinery manufacturer on request



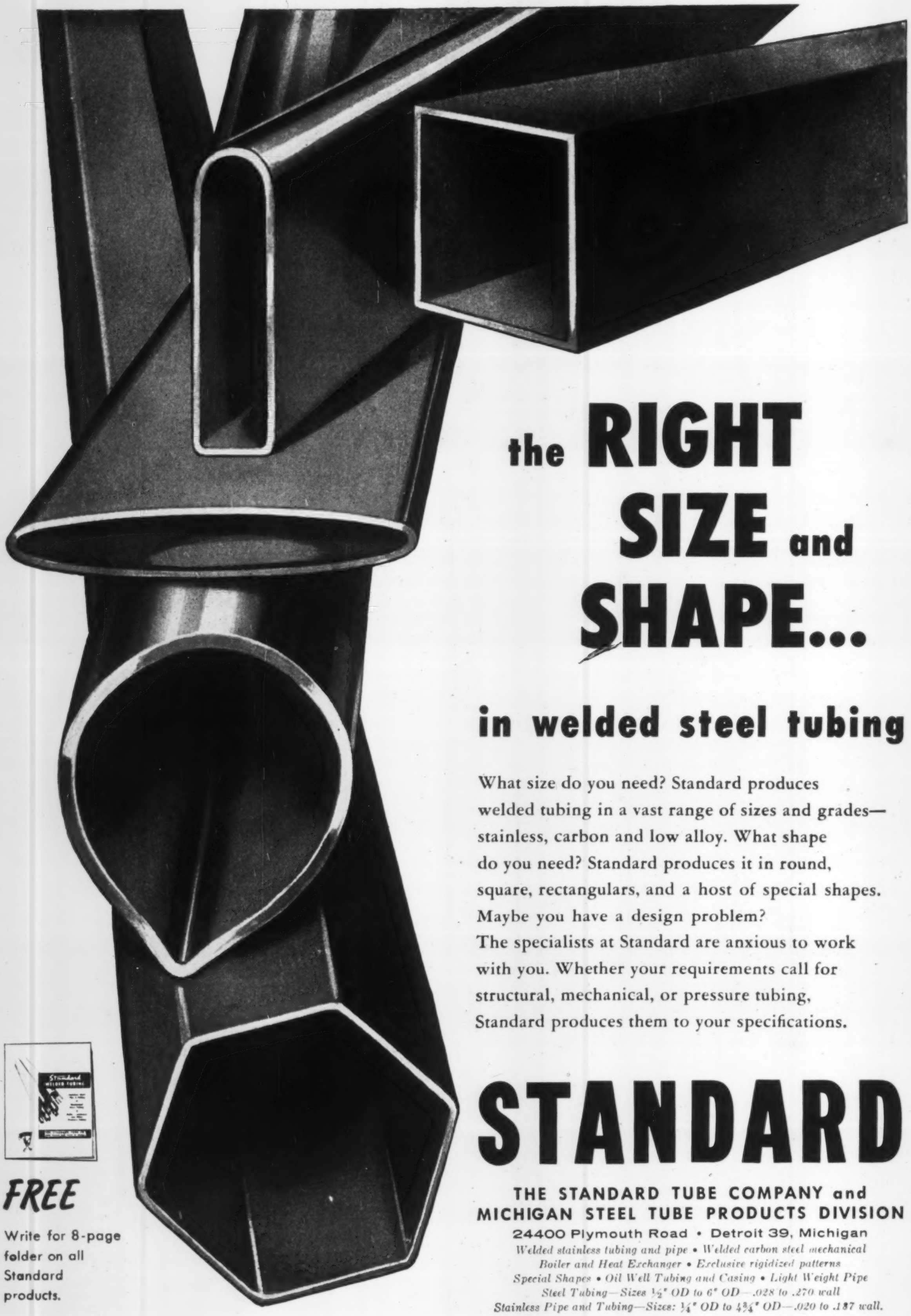
FOR 100% OF ALL METAL CUTTING JOBS

Production-proved products of The Cincinnati Milling Machine Co.

CIMPERIAL—*newest* in the famous, industry-proven line of CIMCOOL° Cutting Fluids!
CIMCOOL S2 Concentrate—The pink fluid which covers 85% of all metal cutting jobs.
CIMPLUS—The transparent grinding fluid which provides exceptional rust control.
CIMCUT Concentrates (AA, NC, SS)—For every job requiring an oil-base cutting fluid.
ALSO—CIMCOOL Tapping Compound—CIMCOOL Bactericide—CIMCOOL Machine Cleaner.

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, O.

°Trade Mark Reg. U.S.Pat. Off.



the RIGHT SIZE and SHAPE...

in welded steel tubing

What size do you need? Standard produces welded tubing in a vast range of sizes and grades—stainless, carbon and low alloy. What shape do you need? Standard produces it in round, square, rectangulars, and a host of special shapes. Maybe you have a design problem? The specialists at Standard are anxious to work with you. Whether your requirements call for structural, mechanical, or pressure tubing, Standard produces them to your specifications.

FREE

Write for 8-page folder on all Standard products.

STANDARD

THE STANDARD TUBE COMPANY and
MICHIGAN STEEL TUBE PRODUCTS DIVISION
24400 Plymouth Road • Detroit 39, Michigan
Welded stainless tubing and pipe • Welded carbon steel mechanical
Boiler and Heat Exchanger • Exclusive rigidized patterns
Special Shapes • Oil Well Tubing and Casing • Light Weight Pipe
Steel Tubing—Sizes ½" OD to 6" OD—.028 to .270 wall
Stainless Pipe and Tubing—Sizes: ¼" OD to 4¾" OD—.020 to .187 wall.

TuBE TALK

The use of high strength steels in electric welded tubing has increased considerably during the past few years as engineers and designers have become acquainted with the availability of such materials. This is especially true of structural members, drive shafts and hydraulic cylinders.

Electric welded tubing can be furnished in carbon and low alloy, high strength steels, which offer not only added strength but improved corrosion and abrasion resistance.

In cylinders, doubling the yield strength of the material would permit either doubling the pressure or cutting the wall thickness in half. The formula for determining internal allowable pressure is:

$P = 2f \frac{t}{D}$, (P = Pressure in psi, f = Fibre stress, t = Wall thickness, D = OD)

For round tubular members used as shafting, the torque strength is also directly proportional to the fibre stress (yield strength) for a given diameter and gauge. Torque value of round tubular sections may be calculated from this formula:

$T = 1968 \frac{D^4 - d^4}{D}$, (T = Torque value @ 10,000 psi fibre stress in inch lbs., D = OD, d = ID)

Note: If fibre stress or yield strength is 30,000 psi, simply multiply the torque value from the above formula by three, or if 50,000 psi, by five, etc.

The torsional value of square and rectangular sections, as well as beam and column strength, is also directly proportional to the yield strength of the material, which often permits lighter sections to be used.

Many of our customers have made savings in excess of 50% by taking advantage of the availability of high strength steels.

Please write to me if you are interested in the use of high strength steels to reduce your costs and save weight in your product.

THE STANDARD TUBE COMPANY

LM Hogan

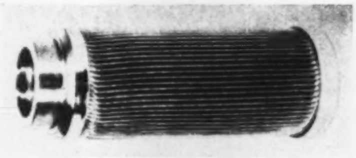
LELAND M. HOGAN
Vice-President

crements, with a full 3 in. forming depth and ½ in. recess on the underside of the fingers.

For further information, *write* Peck, Stow & Wilcox Co., Mill Street, Southington, Conn.

Lightweight Filter Resists Higher Temperatures

LIGHTWEIGHT stainless steel filter elements are locked together under high pressure. They're free of built-in contamination from bonding elements and they have an increased temperature range for a stainless steel filter element (from the normal 500 to 600° F applications up to 1000° F, says the company).



The filters are designed for such uses as oil, fuel, or pneumatic system filtration. You can get capacities of ½, 3, 6, and 12 gpm. Higher capacity elements will also be available.

For further information, *write* Dept. 108, Purolator Products Inc., 1000 New Brunswick Ave., Rahway, N. J.

Fork Truck Device Aids Palletless Load Handling

A FORK truck attachment (Model 5000 Sheet Retrieving Pul-Pac) retrieves load carrying sheets used in palletless handling.

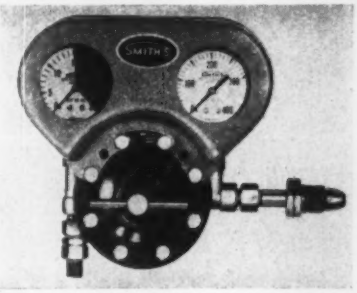
The fork truck unit removes the sheets by either pulling the sheet from under its load or pushing the load off.

The design permits the gripper jaw and pusher rack to act simultaneously or independently. Optional equipment for the attachment includes a side shifting device and a Plexiglas facing for the pusher rack.

For further information, *write* Industrial Truck Div., Clark Equipment Co., 1921 Escote St., Battle Creek 80, Mich.

This Welding Regulator Has Built-in Safety

SAFETY features in this unit eliminate three common dangers of welding regulator misuse. 1. A hard hat protects against exterior abuse.



2. A Flo-trol on the downstream side prevents reverse flow and mixture of gases. 3. A special inlet connector permits quick repair of damaged connections without special tools.

You can get units for use with oxygen, acetylene, or LP gases.

For further information, *write* Smith Welding Equipment Corp., 2633 Fourth St. S.E., Minneapolis 14, Minn.

Cleaning Aid Developed

A LIQUID, Turco Plaudit, has been developed to handle most industrial cleaning operations, including steam, emulsion, immersion, ultrasonic, and wipe-on cleaning. The material is safe for hands, upholstery, painted and other easily damaged surfaces.

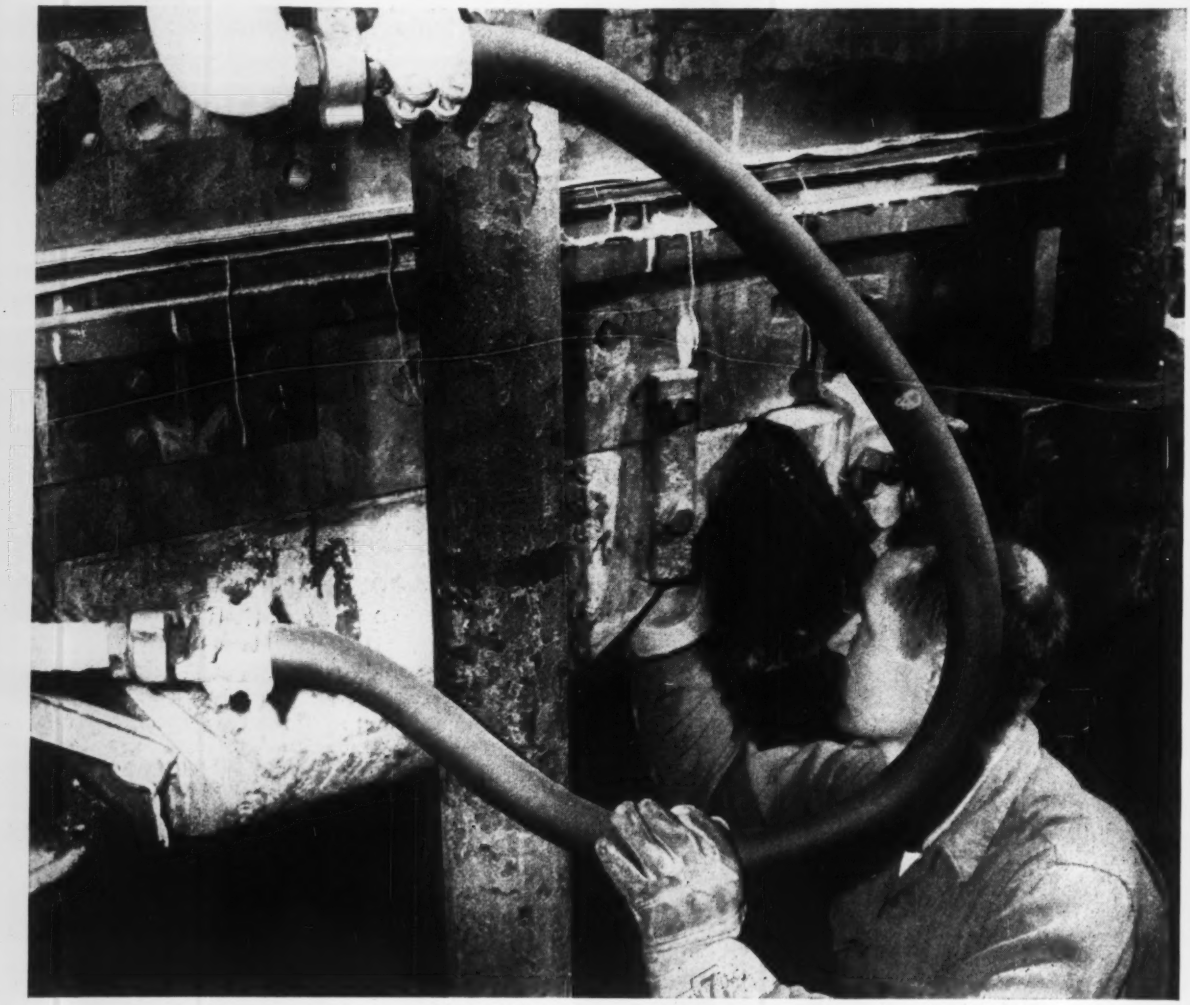
It can quickly and completely remove dirt from such items as parts transfer cases and other hard to clean equipment, says the company.

For further information, *write* Turco Products Inc., 24600 S. Main St., Wilmington, Calif.

Insulating Fire Brick Pure, Low Iron Type

AN INSULATING fire brick (H-W 23-LI, low iron) has been developed for controlled atmosphere furnaces. It has high purity; content of reducible oxides is low. The company

MATCHLESS STEAM HOSE



How to stay alive working next to live steam

Steam—indispensable workhorse in an industrial plant. But if it breaks loose, steam may cause death on contact. Yet this man works with complete security—literally within an inch of his life—because he's working next to the hose that steam cannot burst: wire-braided U.S. Matchless® Steam.

This hose gives ample notice when replacement is needed. Even after long, hard service (and with 200 pound steam pressure) the safety-sure wire-braid construction of U.S. Matchless prevents it from bursting. Instead, just a wisp of steam is allowed to seep through. This acts as a safety device, telling you that replacement is needed. That's why plant safety councils all over the country find no match for U. S. Matchless.

Despite its great ruggedness, this hose is flexible, lightweight, easy to handle.

• •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.
In Canada: Dominion Rubber Company, Ltd.

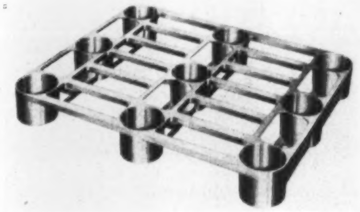
says the brick withstands the most severe reducing atmospheres without evidence of deterioration.

For further information, *write* Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Magnesium Handling Unit Lighter, Cuts Maintenance

A MAGNESIUM handling pallet offers numerous advantages, such as reduced weight, increased load capacities, and greater handling ease.

Elimination of fasteners and easily damaged materials cuts down on maintenance problems. Other features of the unit (also available in aluminum) are consistent size and weight, reduced load damage, four way entry, ease of storage, and personnel safety. Several sizes are available.



For further information, *write* Mag-Craft Corp., 6 E. 28th St., Grand Rapids, Mich.

Mist, Fume Suppressant Works in Finishing Baths

A FUME and mist suppressant (ARP #21 Mistex) handles gas generation problems in chrome plating, anodizing, bright dipping, and other metal finishing processes. The liquid is diluted with water (in ratios from 3 to 20 parts) before adding to the bath. Dilution depends upon conditions under which it's used. It forms a foam blanket (½ in. recommended) that traps gas bubbles and absorbs gas and vapor.

Spray or mist solution loss is reduced. There is also less dragout as the work is removed from the bath. The company says it can cut heating costs by reducing the need for ventilation.

For further information, *write* Allied Research Products Inc., 4004 E. Monument St., Baltimore 5, Md.

Grinding Wheel Treatment Increases Life, Speeds

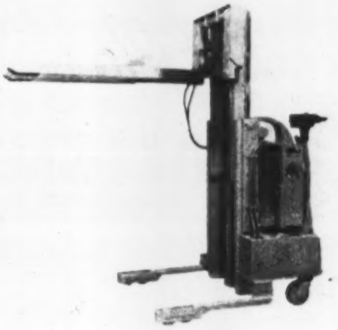
A TREATMENT for grinding wheels called Dri-Kool retards loading and functions as a dry coolant. After dipping, pore surfaces of the wheel become coated with a parting medium. That prevents the chip metal from gripping the abrasive and bond surfaces (with the usual affinity).

Dry grinding of high speed steels is burn and burrfree, says the maker. It also says: Dressings are less frequent; wheels last longer; grinding is faster; micro finishes are improved; one treatment is sufficient.

For further information, *write* King Graphite Products Inc., 21950 Telegraph Rd., Trenton, Mich.

Lift Truck Permits Narrow Aisle Operation

OPERATING features of the standard high lift walkie and the larger counterbalanced fork lift truck have been combined in the Jackstacker Hydrafork.



It permits narrow aisle operation and load handling in and out of bulk storage with no clearance between loads. Hydraulically operated forks extend beyond the front wheels of the truck enabling it to handle different pallet widths.

For further information, *write* Dept. R9-36, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass.

NEW Literature

Write directly to the company for a copy

Fastener Design Catalog

Catalog No. 5918, 80 pages, is a guide for the selection of self-locking nuts suitable for service temperatures above 800° F. Dept. H., Elastic Stop Nut Corp., 2330 Vauxhall Rd., Union, N. J.

Tubular Rivet Chart

A pocket-size slide chart gives complete specifications for three basic tubular rivets. Engineered Fasteners Div., Townsend Co., Box 71-Z, Ellwood City, Pa.

Aluminum Stock Data

"Screw Machine Stock . . . Estimating and Operating Data," 120 pages, has three main sections which detail properties, specifications, estimating information, and shop practices for the light metal. Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.

Electro Clutch Data

A 20 page bulletin R-6304-1B, provides specifications, and design and application data on a complete line of electromagnetic clutches in six series with torque capacities from 1.8 through 13,000 lb-ft. I-T-E Circuit Breaker Co, 1900 Hamilton St., Philadelphia 30, Pa.

Wet Magnetic Particle Inspection

A 36 page booklet describes wet magnetic particle inspection using Immunol 438 in water as the vehicle for oil soluble and water soluble inspection pastes. Harry Miller Corp., Fourth & Bristol Streets, Philadelphia 40, Pa.

Metal Castings Specs

Oremet material specifications for reactive metal castings cover titanium, zirconium, and their alloys. Oregon Metallurgical Corp., P.O. Box 484, Albany, Oreg.

Tap Selector

A slide chart allows the user to select the correct tap for most jobs. Jarvis Corp., S Washington Park, North Attleboro, Mass.

Water Softening Manual

A booklet describes the sodium zeolite water softening process and gives information on selecting and sizing of equipment. Cochrane Corp., 17th Street below Allegheny Avenue, Philadelphia 32, Pa.

Steel Analyses Guide

A 20 page booklet lists the compositions of 40 stainless steels, 184 alloy steels, and 105 carbon steels used in industry. Reader Service Dept., Stainless & Strip Div., Jones & Laughlin Steel Corp., Box 4606, Detroit 34, Mich.

General Electric Announces Newest In The Complete Line Of Adjustable-Speed Drives

PARMATIC SPEED VARIATOR...newest in General Electric's complete line of packaged adjustable-speed drives ... provides greater machine flexibility, better quality control, higher output and efficiency.

STATIC POWER

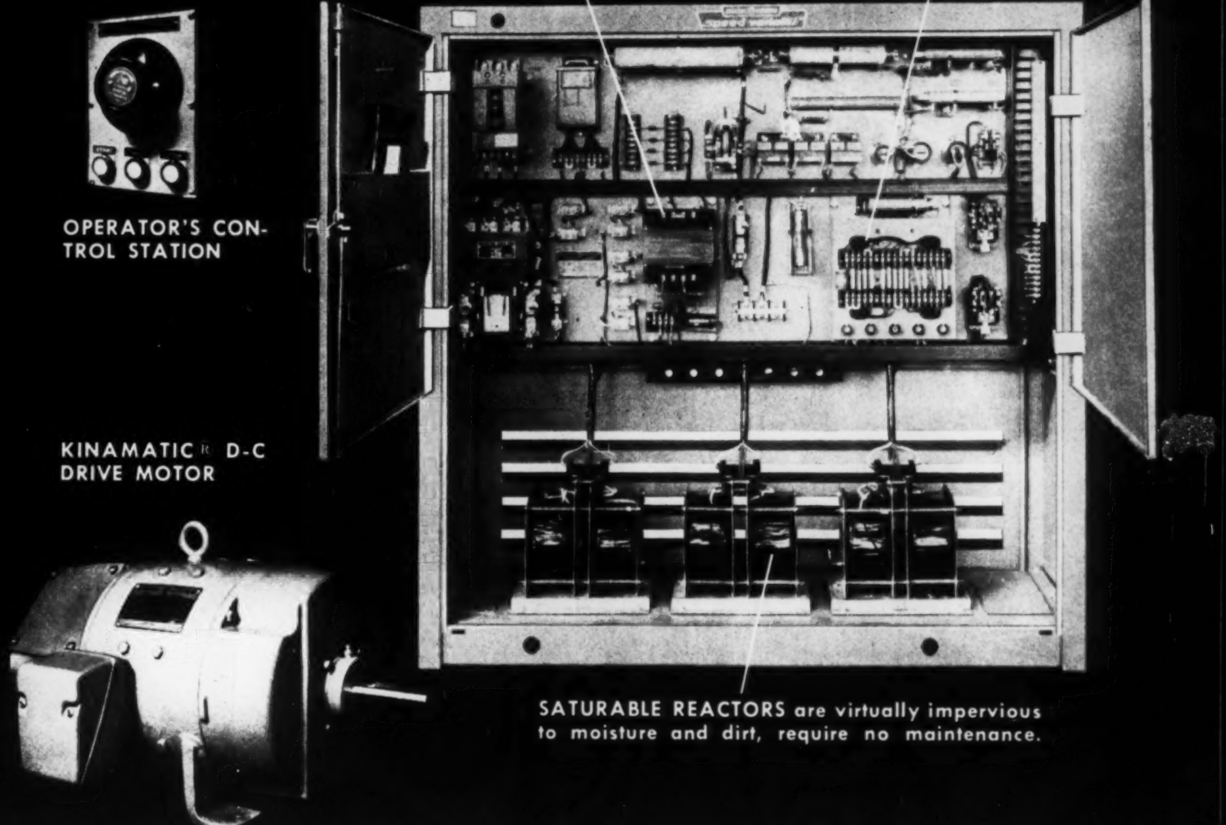
for less maintenance, less downtime, added profit. New excitation and power conversion systems have no rotating parts. Sealed silicon rectifiers and saturable reactors need no warm-up, virtually eliminate power unit maintenance.

25% SMALLER

for easier installation. Reliable, long-life G-E components are factory assembled in compact, space-saving power unit, wired and tested before installation to assure accurate control, reduced installation time and expense.

50% LIGHTER

for lower shipping and handling costs. New Speed Variator meets industry's demand for lighter, more powerful drives—packs more power, weighs 50% less than other drives of comparable rating, 2000 lbs less in 100-hp ratings.



STATIC EXCITER with silicon rectifiers for motor field excitation and control power.

AMPLISTAT REGULATOR with adjustable acceleration and deceleration.

OPERATOR'S CONTROL STATION

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SATURABLE REACTORS are virtually impervious to moisture and dirt, require no maintenance.

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by two years' impressive on-the-job performance in several hundred installations in 15 industries. Experience indicates high operating efficiency, lower cost installation and maintenance for a greater return on your investment.

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- **WIDE SPEED RANGE:** Standard Parmatic Speed Variator provides 8 to 1 range or wider if required.
- **RESISTS CONTAMINATION:** Saturable reactors and hermetically sealed rectifiers resist dirt and moisture.
- **QUIET AND VIBRATIONLESS:** New power unit design eliminates noise and vibration—expands drive versatility.

Limitations: G-E Kinamatic Speed Variator with motor-generator set is recommended for applications requiring power absorption for stopping or overhauling loads. *For more information*, call your General Electric Sales Engineer, or write for GEA-7012, Section 821-1, General Electric Company, Direct Current Motor and Generator Department, 3001 East Lake Road, Erie, Pennsylvania.

GENERAL ELECTRIC

PRECISE GAUGE CONTROL

to your restricted specifications with

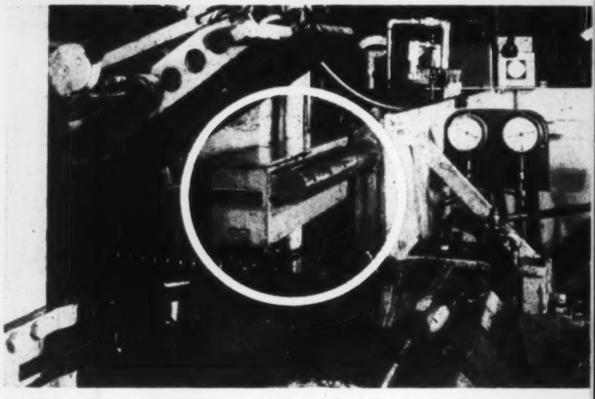
J&L Cold Rolled Strip Steels

In many critical applications, precise gauge control yields worthwhile savings on production costs. Not only does it mean increased tool life but it eliminates grinding for gauge accuracy and reduces quality control costs by minimizing inspection schedules.

At J&L, specially designed cold mills make it possible to exercise precise gauge control — to your specifications. J&L processing techniques include the use of AccuRay gauges to provide exact measurements during rolling. Gauge accuracy is just one of the many restricted specifications which can be met consistently by J&L.

J&L offers you an experienced organization devoted to strip steel processing combined with fully integrated production facilities.

For your convenience, precision strip facilities are available to you in our plants at Youngstown, Indianapolis, Los Angeles and Kenilworth (N. J.)



Typical of J&L precise control is this AccuRay thickness gauge to help assure tolerances on cold rolled strip steels.

STRIP

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TEMPERED SPRING STEEL • ZINC AND COPPER COATED

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Youngstown 1, Ohio

Week's Output May Break Record

RECORD breaking ingot production is a strong possibility this week if steelmakers can avoid trouble with men, machinery, and the weather.

Thus far, they've had excellent co-operation from all three. Until last week, when a Midwestern mill fired three local union leaders for allegedly promoting a slowdown, there had been no reports of labor strife. Furnace and equipment failures have been so few that steelmakers can scarcely believe it. Except for a brief cold wave in November, the weather has been mild.

ONWARD AND UPWARD—Last week, industry furnaces were operated at 95 per cent of capacity, 1.4 points above the previous week's revised rate. Production was about 2,690,000 ingot tons, the highest in history. If steelmakers are to break that record before the end of the year, they'll almost certainly do it this week. Reason: There's a traditional letdown during the holidays. Anyone who wants to work on Christmas or New Year's eve will probably be given the opportunity, but it's a foregone conclusion that many will choose to stay home.

USERS ANXIOUS—Even though the mills are pouring ingots at an unprecedented pace and shipping finished steel at 90 per cent of capacity, users aren't satisfied. They're trying to build their inventories before Jan. 26 when the steelworkers threaten to strike again. Demand for flat rolled stock is so great that leading suppliers are altering their product plans, diverting ingots from production of less urgently needed material to the sheet mills.

SECONDS, ANYONE?—Because sheets are so hard to get, consumers are showing a lot of interest in "seconds" and "rejects." They're willing to pay prime quality prices for material that doesn't quite measure up, if the defects aren't serious enough to jeopardize the quality of their own products.

AUTOMAKERS ACCELERATE—Movement of steel to the automotive industry has been heavy enough to permit quick resumption of high level operations. General Motors Corp., hardest hit by the strike, has recalled 184,000 of the 215,000 employees it furloughed and hopes to summon the rest this week. To protect itself against a postinjunction strike, American Motors Corp. says it has acquired "several thousand tons of ingots for conversion." If a second walkout is avoided, AMC will use the steel to increase its output of cars and appliances.

DISTRIBUTORS REBUILD—Inventories of steel service centers won't drop below the current level of 825,000 tons, predicts the Steel Service Center Institute. (At the beginning of the strike, stocks were at an all-time high of 3.7 million tons.) Receipts from mills in December will simply offset shipments to customers, so there will be no buildup until January.

Service centers have few complaints about the way they're being treated by suppliers. By the end of the first quarter, they expect to have normal stocks of specialties: Stainless, alloys, tubing, and cold finished bars. During the second quarter, they'll get up to par on hot rolled bars, standard structurals, wide flange beams, light plates, sheets, galvanized items—in that order. Midyear inventory objective: About 3.4 million tons.

WHERE TO FIND MARKETS & PRICES

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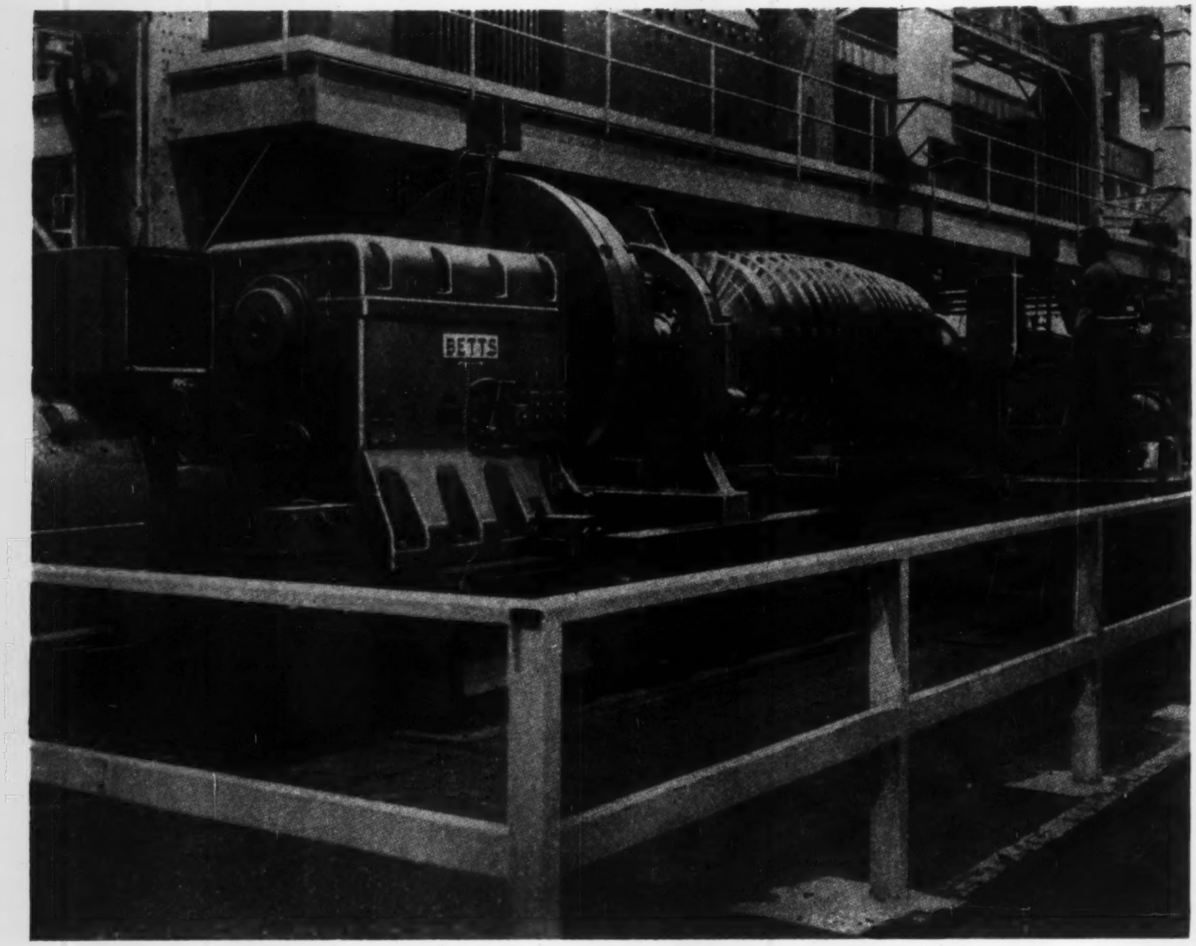
*Current prices were published in the Dec. 7 issue and will appear in subsequent issues.



SPECIALLY DESIGNED LATHE

grooves rotors for large steam turbines

Shown at work is one of three Farrel-Betts 60″ heavy-duty lathes built for General Electric Company's Large Steam Turbine-Generator Department at Schenectady, N. Y. It was designed for both speed and accuracy in machining turbine rotor grooves of various depths from steel alloy forgings.

The rotors are grooved by front and rear tools in a plunge cut. The front tool takes out the center section of the chip so that the slot is cut to full width in one pass. The lathe takes cuts 2″ wide at 220-sfpm speed and .028-ipm feed, resulting in a metal-removal rate of 168 cu. in. per minute.

A special electrical dimensioning system indicates the carriage position along the bed for accurate groove positioning. Replaceable hardened and ground steel ways of the square-lock type are used.

Bulletin 1216 will give you more complete information about the design and performance of Farrel-Betts heavy-duty lathes. Ask for a copy today.

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CM-51

FARREL
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Strike Slows Sheet Steel Recovery

THIS YEAR'S shipments of hot and cold rolled carbon steel sheets, severely retarded by the industry strike, will top 1958's volume by only 2 million tons. Last year's business, lowest since 1954, totaled 16.2 million tons.

First half shipments this year set a new record with 5,283,039 tons of hot rolled and 8,535,027 tons of cold rolled sheets moved by producers. No second half figures are available yet; producers are too busy getting operations going to add them up. Industry estimates, however, are that production will reach 4.7 million tons for the full half, including the output of producers that kept operating during the strike.

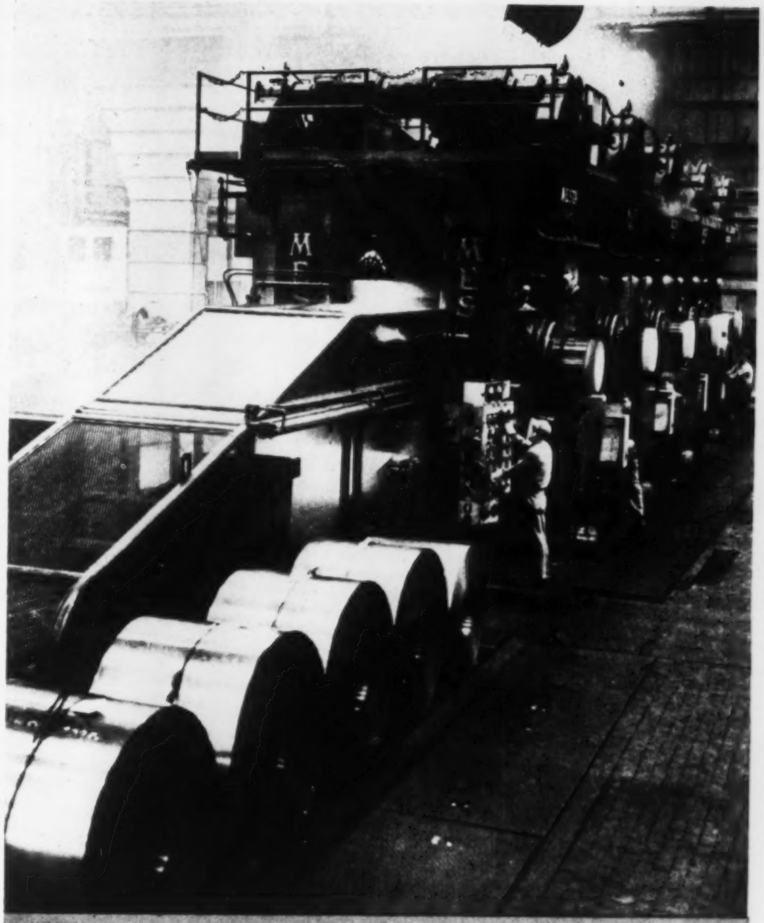
Of the 13.8 million tons shipped in the first half, 6.5 million went to the industry's best customers, automakers and automotive suppliers. Today, with the mills rolling again, most buyers are still weeks away from balanced inventories.

Prospects for 1960 business are "excellent," barring resumption of the strike. Rolling mills are already choked with orders for the first half.

- **Exports Fall**—Movement of U. S. sheets overseas fell sharply in the first three quarters of this year. Exports of hot rolled sheets will total more than 67,000 tons and cold rolled more than 200,000 tons for the year. Last year, 167,875 tons of hot rolled and 318,202 tons of cold rolled sheets moved overseas.

Canada, our best export customer, bought 62,027 tons of hot and cold rolled sheets in the first nine months of this year vs. 137,373 tons in all of 1958. West Germany is second with 46,289 tons bought in the first three quarters of this year vs. 66,790 tons in 1958.

- **Imports Jump** — Pressing shortages of sheets were reflected in a heavy increase of import buying. Imports, in the first nine months, reached 133,824 tons of hot and cold rolled sheet and strip vs. 8438 tons in the corresponding 1958 period and 25,181 tons for all of last year.



U. S. Steel

Shipments of Hot and Cold Rolled Carbon Sheets

(Those to reporting companies for conversion or resale deducted)

(Net tons)

	Hot	Cold	Total
*1959	7,000,000	11,500,000	18,500,000
1958	6,046,000	10,176,000	16,222,000
1957	7,492,000	11,701,000	19,193,000
1956	8,368,000	13,099,000	21,467,000
1955	9,022,000	14,964,000	23,986,000
1954	5,876,000	9,466,000	15,342,000

Source: American Iron and Steel Institute.
*STEEL estimate.

A further upsurge in incoming cold rolled sheets is expected in the current quarter, despite advancing prices and delivery extensions. Western European producers now have little to offer before the second quarter of 1960. Warehouses are the major import customers, although growing direct sales are bringing makers of steel shipping containers, farm machinery, air conditioning equipment, office furni-

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Special precision nuts are not "off-the-shelf" items. Whether standard or miniature in size, they require *special* engineering, production facilities and quality controls.

As the leading manufacturer of *turned* brass and aluminum nuts, Fischer can supply a complete range of types and sizes to meet specialized requirements . . . including miniaturization.

Whatever your application, if you are looking for extreme accuracy and prompt delivery at competitive prices . . . let Fischer quote your next order.

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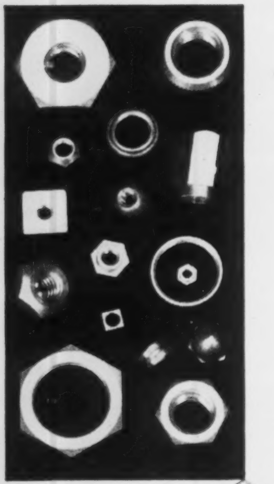


ture, door bucks, and auto parts into the market.

Domestic mills see enough work ahead to keep them operating at near peak throughout the first half of next year, assuming no new labor shutdowns. A peaceful settlement of negotiations may not avert some deferments and cancellations, but none will be of major importance, say producers.

Lower Prices Expected on Imported Steel Products

Substantial tonnages of imported steel shipped into the Houston market on speculation before and during the steel strike, are still unsold. A final industry-union settlement would likely result in some sharp price reductions on the material.

Imports into the area during the first quarter (1960) are expected to show a decline because many buyers have been holding back orders in anticipation of uninterrupted U. S. production. Foreign mill prices range from $12 to $15 a ton under domestic levels—not enough of a spread to attract buyers under normal conditions.

Foreign mill books are now open for April-May shipments, and many buyers are still holding off placing orders because they feel large orders placed now may turn out to be a poor gamble. One authority says foreign mill prices will be reduced in January if the steel labor dispute is settled. The January reductions would apply on May-June shipments.

Sheets, Strip . . .

Sheet & Strip Prices, Page 146 & 147

Supply of sheets and strip is tightest of all the major steel products. Demand pressure is greatest for cold rolled and galvanized, but requirements for hot rolled are only a little less pressing.

Producers could easily fill their rolling schedules on cold rolled and galvanized for the entire first half of 1960 were they disposed to accept orders that far ahead. Flat rolled specialties are not quite so tight, but even here, tonnage for first quarter shipment is hard to place.

Despite rising mill shipments, consumers won't be able to rebuild their depleted inventories for many weeks. Much depends, of course, on what transpires in the steel wage negotiations the next couple of weeks. Quick settlement of the labor dispute will assure steady mill shipments, but another work stoppage would be disastrous for many consumers—they won't have enough steel to support operations for any time at all as shipments during the Taft-Hartley truce will not be sufficient to permit much stockpiling.

The Navy closes Dec. 21 on 800 tons of carbon steel sheets and strip at Philadelphia; 180 tons are corrugated.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 146

Pacific Coast Div., Bethlehem Steel Co., Seattle, has booked an order for 14,000 tons of reinforcing bars to be used in the construction of missile launching facilities in central Washington State.

Other building bar tonnages in the Pacific Northwest include: 1500 tons for a Seattle freeway overpass. Several sizable projects involving bars are scheduled for placement within 30 days.

Steel Bars . . .

Bar Prices, Page 145

Consumers of hot rolled bars who failed to cover their third quarter requirements before the strike are severely pinched for supplies.

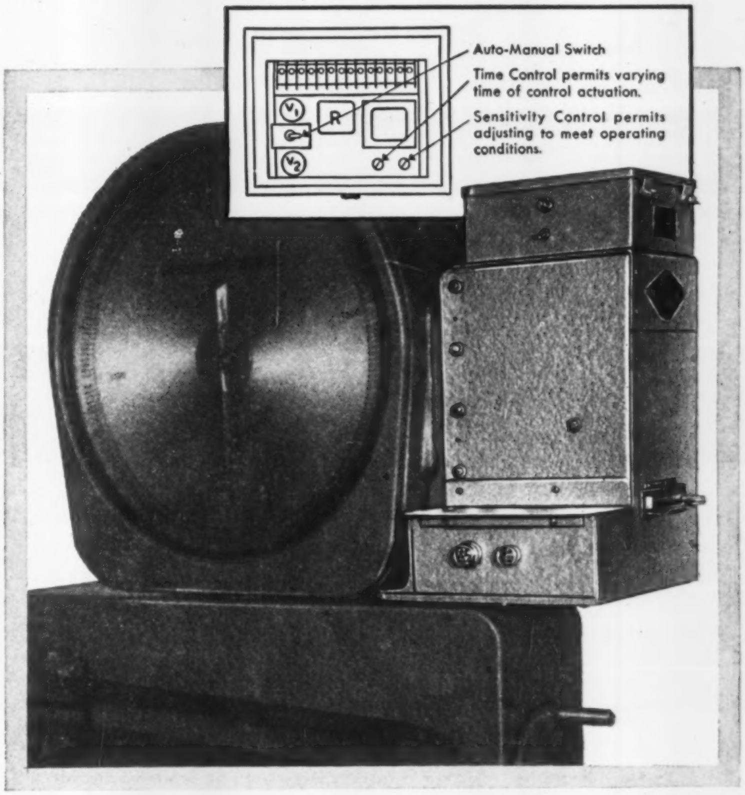
Leading producers are sold out well into May. Some hold definite specifications, and could sell beyond that month if they cared to. Actually, they are receiving inquiry for the third quarter which they are turning away. Only under special circumstances are they accepting second quarter tonnage.

Deliveries on hot alloy bars are not as extended as those on the hot carbon grade. One maker says he can still accept some tonnage for March shipment.

Cold drawn bar deliveries from captive plants have jumped sharply. Stocks on hand at the time of the strike in July have been largely consumed since resumption of mill operations early last month, with the result cold drawers have little tonnage to offer under three or four months' delivery. This situation applies to both cold drawn carbon and alloy bars.

The converters are getting sub-

NEW Fairbanks-Morse Electronic Weight Detector



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V_1
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Auto-Manual Switch
Time Control permits varying time of control actuation.
Sensitivity Control permits adjusting to meet operating conditions.

Prevents incorrect weighing . . . stops costly errors!

With the new Electronic Weight Detector, true weight of any load can be automatically obtained and recorded without need of a weighman. Where a weighman is used, it is impossible for him to record incorrect weights or start a sequence at the wrong time. When desired, a flip of the switch can disengage the Weight Detector entirely from the system. *This is the first fully-reliable control of its kind available in the scale industry.*

To completely automate your weighing—to be sure that your weights are correct—to protect yourself by completely policing your entire weighing operation—contact your nearby Fairbanks-Morse Field Engineer, or write directly to Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois for complete information.

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Gears which must operate smoothly and without vibration at higher speeds and under greater loads must correspondingly be more accurate in tooth profile and spacing.

H & S Generated Gears provide these results.

To meet increasing customer demands, Horsburgh & Scott has broadened its manufacturing capacity and tooled to produce *large* Generated Gears up to 125" diameter.

Offering the same high quality standards which characterize the complete H & S Gear line, production capacities for large Spur, Helical and Hobbed-Herringbone Gears are now available in the following dimensions:

Up to 80" outside diameter at 1 DP
Up to 90" outside diameter at 1¼ DP
Up to 100" outside diameter at 1½ DP
Up to 125" outside diameter at 2 DP

Face widths up to 42", depending on helix angle.

Take advantage of this new capacity, and our long experience as specialists in this field. Send your specifications, drawings or plans — or tell us about your power transmission problem. Our technical staff will promptly consider your requirements and render recommendations and quotations.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
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stantial shipments from the hot bar mills, but it will be some time before they catch up with order accumulations.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Some pipe mills expect to catch up with demand for drill pipe and casing by February, and on tubing no later than March. At least one producer's line pipe backlog, however, extends for five months and there's little chance of getting new tonnage on books until second quarter.

The demand for standard pipe is slow. The slump is seasonal. The mills expect to be in good shape on deliveries no later than next month. Seamless deliveries, however, are much farther extended with September-October orders scheduled to be shipped in January and February.

The traditional yearend upturn in oil drilling is continuing. Hughes Tool Co.'s survey showed 2213 rotary rigs at work during the week ended Nov. 30. The count was seven more than in the previous week, and 34 more than in the comparable week a year ago.

Plates . . .

Plate Prices, Page 145

Some platemakers are in position to take new orders for delivery within seven to ten weeks. Others, however, are booked up into April and are discouraging all orders for shipment beyond that month. In certain plate specialties, shipments can be had within five to six weeks.

One eastern plate mill, which operated throughout the strike, will open its books for second quarter business shortly after Jan. 1.

The chemical industry is providing strong demand. Also, fabricators of large field storage tanks are actively in the market.

The City of Seattle set Dec. 16 as the bid date for the 7 mile Kirkland water extension, involving about 2700 tons of 36 and 42 in. plate pipe.

Lukens Steel Co., Coatesville, Pa., has resumed operation of its 206-in. mill, down the last couple of weeks because of motor trouble.

Lukens recently entered into an interim agreement with its employees. Certain local issues were settled, and remaining issues will be adjusted in line with whatever the major steel producers and the steelworkers' union finally agree upon. Until then at least, no disruption of operations is assured.

Tantalum-Tungsten Sheets Of High Purity Offered

High purity, 90 per cent tantalum-10 per cent tungsten alloy sheets, in widths up to 8 in. and thicknesses from 0.010 in. to heavy plate, are now commercially available from the Metals Div., National Research Corp., Cambridge, Mass. The alloy is for use in rocket engines, missile structures, electronic components, and other applications where temperatures exceed 3000° F.

The sheet form is the first in a series of tantalum-tungsten alloy mill products under development by the Metals Div. to be made available to industry in commercial quantities.

Tin Plate . . .

Tin Plate Prices, Page 147

Canmakers are taking all of the tin plate they can get. They are expected to be actively in the market throughout the first half of next year. Still, little pressure is being exerted on the mills since the producers have informed their canmaking customers what tonnage they can expect to receive.

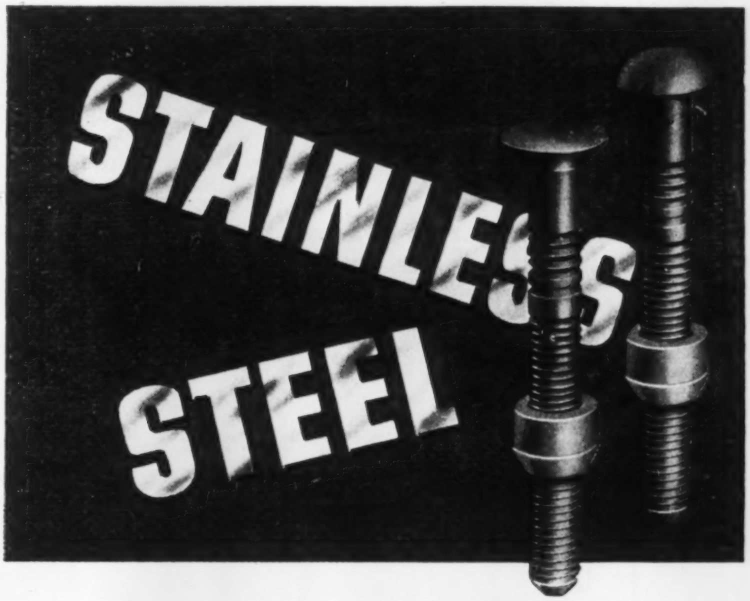
Generally, the canmakers were well supplied when the steel strike started. They had moved into their own plants all the tin plate the mills were able to produce. Now, however, their inventories are low and unbalanced.

Distributors . . .

Prices, Page 150

Steel service centers note a seasonal lull in business. They predict a drop in bookings this month compared with those in November which, in turn, were down from the October total. Shortage of supplies has been a contributing factor.

Distributors are getting some steel from the mills, but they do not expect to replenish their stocks fully for several months. Most incoming tonnage from mills is allocated against orders and shipped as fast as it can be processed. Flat rolled



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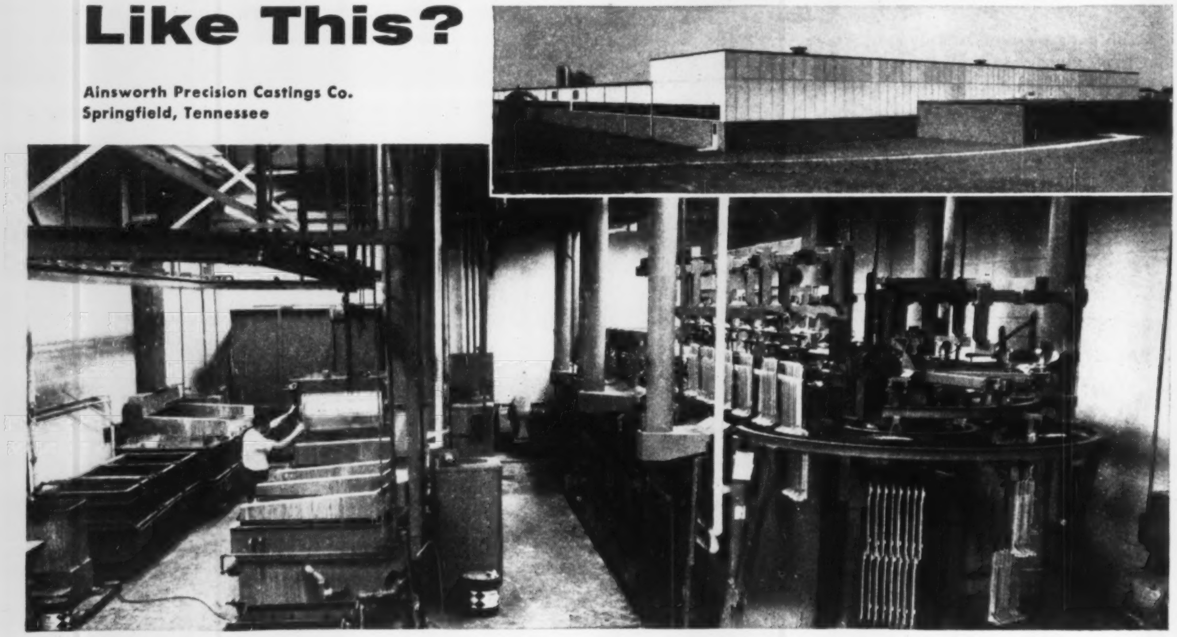

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products are in strongest demand. Stainless steel products are in fair supply because a number of producing mills continued to operate during the industry-wide strike.

In the Houston area, most service centers will establish sales records for the year; for others, the second best and just short of the peak year (during the Korean War). Poor demand from the petrochemical industries is limiting bookings.

Erle M. Jorgensen Co., Los Angeles, is adding 55,000 sq ft to its Oakland, Calif., steel and aluminum distributing plant.

Wire . . .

Wire Prices, Pages 147 & 148

Fabricators of wire products for the automobile industry are getting heavier releases for parts, and in most cases have enough finished wire on hand to meet demands. Shipments of rods and finished wire are heavier, but in many cases tonnage is allocated and probably will continue so through early first quarter.

Ferroalloys . . .

Production of silicon alloys (silvery pig iron, electric furnace ferrosilicon, silicon briquets, silicon metal, and other silicon alloys) in the third quarter of 1959 totaled 160,825 net tons, down 23 per cent from the 207,621 tons produced in the preceding three months.

In the same period, shipments amounted to 126,825 tons, off 42 per cent from the 219,895 tons shipped in the preceding quarter. In addition, 11,697 tons of silicon alloys were used in producing other silicon alloys.

Shipments for the first nine months amounted to 538,902 net tons vs. 506,584 in 1958, 768,700 in 1957, and 865,953 in 1956.

Imports in the first nine months were 15,690 tons and exports 4306 tons. In 1958, imports were 11,619 tons and exports 2176; in 1957, imports were 19,904 tons and exports 2649; in 1956, imports were 22,017 tons and exports 2114 tons.

Apparent consumption in the third quarter was 132,839 tons vs. 222,006 in the second quarter, and 195,441 tons in the first three months. The total for the first nine months was 550,286 tons compared with 516,027 in 1958, 785,955 in 1957, and 885,856 in 1956.

Structural Shapes . . .

Structural Shape Prices, Page 145

Structural awards continue slack, with public work outstanding, chiefly bridge construction. So far this year, fabricators have booked about 3.1 million tons of steel for buildings and bridges. Shipments are estimated at 2.85 million tons, about 20 per cent under the 1958 total.

The structural mills this year shipped to all industry around 3.75 million tons (heavy structurals) vs. slightly better than 3.9 million tons in 1958. Buying for stockpile in anticipation of the steel work stoppage was heavy early this year.

Right now, standard shapes are available from the mills in 10 to 14 weeks, and wide flange sections in 17 to 21 weeks. Deliveries, of course, are dependent upon no resumption of the work stoppage next month.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4000 tons, superstructure, post office, Detroit, to Bethlehem Steel Co., Bethlehem, Pa.; Barton-Malow Co., Detroit, general contractor.

3089 tons, state highwaywork, Broome County, New York, through John Arborio Inc., Poughkeepsie, N. Y., to Harris Structural Steel Co., New York; 1322 tons of reinforcing bars also required.

1870 tons, state highway bridges, Jefferson County, New York, to American Bridge Div., U. S. Steel Corp., Pittsburgh; Arute Bros. Inc., New Britain, Conn., general contractor.

1865 tons, state highwaywork, Franklin-St. Lawrence Counties, New York, through Gilbane Building Co., Providence, R. I., general contractor, to Ingalls Iron Works, Vernon, Pa.; a substantial tonnage of reinforcing bars went to Bethlehem Steel Co., Bethlehem, Pa.

1165 tons, eight state highway structures, Washington County, Virginia, to Bristol Steel & Iron Co., Bristol, Va.; Troitino & Brown Inc., Asheville, N. C., general contractor.

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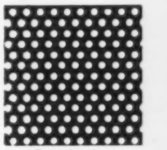
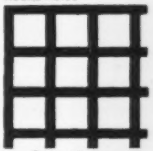
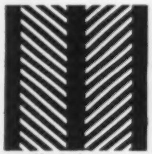

Round holes

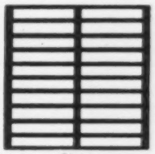
Whenever—wherever—your products require perforated materials, you will find the pattern and open area "just right" for that custom-look in the vast selection of H & K existing dies.

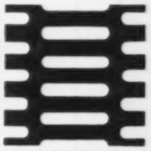
Modern facilities and H & K experienced craftsmanship, enable the perforating of practically all metals, wood, compositions and plastic. Perforated materials can be furnished in sheets, coils, rolls or plates. Fabricating services include shearing, rolling, welding and forming.

Illustrations shown in reduced size


Square holes


Herringbones


Slots


Oblong holes

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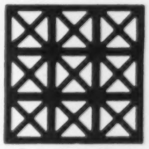
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940 tons, Montana state project, Yellowstone River, 730 ft highway bridge, to Pacific Coast Div., Bethlehem Steel Co., Seattle; W. R. Cahoon Construction Co., Pocatello, Idaho, general contractor at $642,857.

900 tons, Hopkins Center buildings, Dartmouth College, Hanover, N. H., to Haarmann Steel Co., Holyoke, Mass.; John A. Volpe Construction Co., Malden, Mass., general contractor.

800 tons, structurals and reinforcing bars, research laboratory, Chemstrand Corp., Chapel Hill, N. C., to Decatur Iron & Steel Co., Decatur, Ala. (structurals), and Southern Steel Products Co. Inc., Gastonia, N. C. (reinforcing bars); Daniel Construction Co. Inc., Greenville, S. C., general contractor.

700 tons, plant, Fairmount Aluminum Co., Fairmount, W. Va. to Pittsburgh Bridge & Iron Works, Rochester, Pa.

375 tons, structurals and bars, Jonathan Law High School, Milford (Devon), Conn., to Connecticut Steel Co., New Haven, Conn.; John Zandonella Inc., Bridgeport, Conn., general contractor.

350 tons, Overlea High School, Towson, Md., to Potts Mfg. Co., Mechanicsburg, Pa.; Joseph F. Hughes & Co., Baltimore, general contractor.

350 tons, structurals and bars, Lombard Junior High School, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa. (structurals), and Capitol Steel Co., Baltimore (reinforcing bars); Piracci Construction Co., Baltimore, general contractor.

250 tons, Edgar Allan Poe School, Annadale, Va., to Southern Iron Works Inc., Springfield, Va.; Eugene Simpson & Bros., Alexandria, Va., general contractor.

205 tons, bridge, FAI Route 70 Sec. 25-3HB, Effingham County, Ill. for State of Illinois, to Vierling Steel Works, Chicago.

150 tons, sawmill, Crown-Zellerbach Co., Columbia City, Oreg., to Pacific Coast Div., Bethlehem Steel Co., Seattle.

150 tons, U. S. Gypsum Co., warehouse, Seattle, to Leckenby Structural Steel Co., Seattle.

150 tons, nine-story garage, Third and Pine Streets, Seattle, to Leckenby Structural Steel Co., Seattle, on subcontract from Joseph T. Ryerson & Son Inc., Seattle.

117 tons, brewery addition, Hudepohl Co., Cincinnati, to William Lang & Sons Co., Cincinnati; Frank Messer & Sons Inc., Cincinnati, general contractor; reinforcing bars to Pollak Steel Co., Cincinnati.

STRUCTURAL STEEL PENDING

2795 tons, I-beam bridges, Waco dam and reservoir, Bosque River, Texas; bids Dec. 22, U. S. Engineer, Ft. Worth, Tex.; also 1150 tons, concrete reinforcing bars; alternate on prestressed concrete for bridge structures.

1530 tons, gates, stoplogs, and transfer car, Niagara project No. NP46; bids Dec. 17, New York State Power Authority, New York.

1100 tons, including joists, mental hospital, Haverford, Pa., for General State Authority; Paul Tishman, New York, low on general contract; 1600 tons of reinforcing bars also required.

500 tons, Coliseum building, Seattle Exposition project; bids to State Department of Commerce, Seattle, Jan. 19; estimated cost is $3,812,000.

370 tons, channels and angles, bids Dec. 28, U. S. Engineer, Chicago.

175 tons, also 40 tons of reinforcing, Washington State, Kettle River bridge; general contract to Henry Hagman, Spokane, Wash., low at $266,868.

REINFORCING BARS . . .

REINFORCING BARS PLACED

14,000 tons, three missile launching sites, central Washington State, to Pacific Coast Div., Bethlehem Steel Co., Seattle; subcontract from a Los Angeles firm; general contractor, MacDonald Construction Co., St. Louis, and Scott Co., Oakland, Calif., joint low at $31,600,722.

3000 tons, Federal Office Building, Houston, to Texas Cold Finished Steel Co., Houston; Fisher Construction Co., Houston, general contractor; 80 tons of structurals to Offenhauser Co.

1322 tons, state bridgework, Broome County, New York, to unnamed supplier; 3089 tons of structurals to Harris Structural Steel Co., New York.

950 tons, building, Bowman Biscuit Co., Denver, Colo., to K. C. Construction Supply Co., Denver; Long Construction Co., Denver general contractor.

581 tons, eight highway structures, Washington County, Virginia, to Callaway Building Products Co., Knoxville, Tenn.; Troitino & Brown Inc., Asheville, N. C., general contractor.

560 tons, five-story federal building, Charleston, W. Va., to Connors Steel Div., H. K. Porter Company Inc., Huntington, W. Va.; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

530 tons, state highway structures, Jefferson County, New York, to Truscon Steel Div., Republic Steel Corp., New York; Arute Bros. Inc., New Britain, Conn., general contractor; steel piling to Union Metal Mfg. Co.

500 tons, Hopkins Center buildings, Dartmouth College, Hanover, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; John A. Volpe Construction Co., Malden, Mass., general contractor.

500 tons, pharmacy wing, University of Florida, Gainesville, Fla., to Laclede Steel Co., St. Louis; William A. Berbusse Jr. Inc., Palm Beach, Fla., general contractor.

380 tons, high school, Irving, Tex., to Ceco Steel Products Corp., Dallas; Yates Construction Co., Dallas, general contractor.

280 tons, brewery addition, Anheuser-Busch Inc., Tampa, Fla., to Laclede Steel Co., St. Louis; George A. Fuller Co., Atlanta, general contractor.

175 tons, Montana state project, Yellowstone River highway bridge, to unstated interest.

REINFORCING BARS PENDING

1600 tons, mental hospital, Haverford, Pa., for General State Authority, Harrisburg, Pa., to Paul Tishman, New York, general contractor; also 1100 tons of structurals and joists required.

1050 tons, Everett-Hopkinton Dam, New Hampshire; Perini Corp., Framingham, Mass., low on general contract.

790 tons, municipal sewagework, Philadelphia; bids opened Dec. 8.

780 tons, factory addition, Philco Corp., Philadelphia, Irwin & Leighton, Philadelphia, general contractor.

307 tons, state highway structures, Northfield-Tilton, N. H., contract No. 1; Suburban Excavators Inc., Wakefield, Mass., low on general contract.

200 tons or more, Coliseum building, Seattle Exposition; bids to State Commerce Department, Seattle, Jan. 19.

180 tons plus, 460 ft Bureau of Public Roads bridge, Whatcom County, Washington; Charles T. Parker Construction Co. and Pacific Concrete Co., Portland, Oreg., joint low at $870,000.

110 tons, steel sheet piling, U. S. Engineer, San Francisco.

100 tons or more, Tacoma baseball stadium; Nelson Construction Co., Tacoma, Wash., low at $534,700.

100 tons or more, M Street bridge, Tacoma, Wash.; general contract to Woodworth & Co., Tacoma, low at $121,703.

PLATES . . .

PLATES PLACED

1725 tons, high tensile, Grade Hy-80, Navy Purchasing Office, Washington, to Lukens Steel Co., Coatesville, Pa.

745 tons, high tensile, Navy Purchasing Office, Washington, to Wickwire-Spencer Div., Colorado Fuel & Iron Corp., Wilmington, Del.

702 tons, high tensile, Navy Purchasing Office, Washington, to Phoenix Steel Corp., Harrisburg, Pa.

327 tons, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa., 61 tons of sheets to Caine Steel Co., Chicago.

255 tons, carbon, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

141 tons, stainless, General Stores Supply Office, Navy, Philadelphia, to Eastern Stainless Steel Corp., Baltimore, 60 tons; to Ingersoll Steel Div., Borg-Warner Corp., Chicago, 60 tons; to Caine Steel Co., Chicago, 21 tons; also, 110 tons of sheets to Ingersoll Steel Div., Borg-Warner Corp., Chicago.

PLATES PENDING

2700 tons, Kirkland extension, 7 mile, 36 and 42 in. water supply line; bids to Seattle, Dec. 16; alternatives for concrete cylinder.

DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Dec. 13	Change	Same Week 1958	Same Week 1957
Pittsburgh	95	+ 1*	72	67
Chicago	92.5	+ 1.5*	85	75
Eastern	95	+ 2	71	81
Youngstown	99	+ 1	60	65
Wheeling	95	+ 2	83.5	61.5
Cleveland	96	+ 1.5*	69	68
Buffalo	105	— 2.5	68.5	63.5
Birmingham	86.5	— 2	65	67
Cincinnati	100.5	+ 1.5*	80	72.5
St. Louis	108.5	+ 2*	83.5	60.5
Detroit	98.5	+ 5.5*	99.5	91.5
Western	94	+ 2	79	80
National Rate	95	+ 1.4*	75.5	69

INGOT PRODUCTION

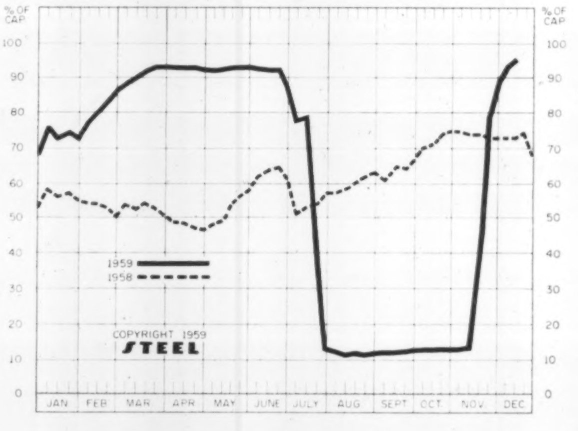
	Week Ended Dec. 13	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	167.5†	165.0	80.4	123.6
NET TONS (In thousands)	2,690†	2,650	1,291	1,985

*Change from preceding week's revised rate.

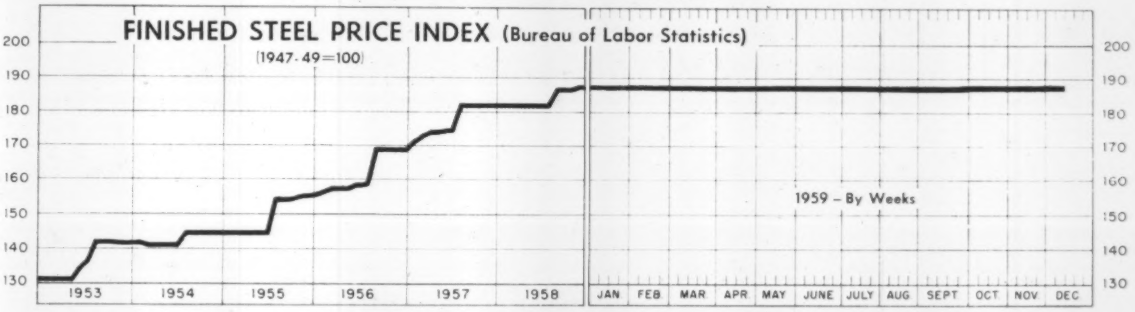
†Estimated by STEEL; comparative figures reported by AISI.

Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Dec. 8, 1959	Week Ago	Month Ago	Nov. Index	Year Ago
186.8	**186.8**	**186.8**	**186.8**	**186.9**

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Product	Price
Rails, Standard No. 1 ...	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb) ...	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon ...	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.765
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.585
Pipe, Line (100 ft)	199.533
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft) ...	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box) ...	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon ...	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common.	9.825
Wire, Barbed (80-rod spool)	8.758
Woven Wire Fence (20-rod roll)	21.793

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100) ..	247.82	247.82	247.82	247.82	194.53
Index in cents per lb	6.713	6.713	6.713	6.713	5.270

STEEL's ARITHMETICAL PRICE COMPOSITES*

	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Finished Steel, NT	$149.96	$149.96	$149.96	$149.96	$117.95
No. 2 Fdry, Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT ...	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT ...	42.83	42.67	45.33	39.17	32.58

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*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

FINISHED STEEL	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh ...	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia..	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh ...	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh ...	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh ..	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	5.85
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.65	$9.05

*Including 0.35c for special quality.

SEMIFINISHED STEEL

SEMIFINISHED STEEL	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods, $\frac{7}{32}$-⅝" Pitts. ...	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton

PIG IRON, Gross Ton	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia ..	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila. ..	70.91	70.91	70.91	70.91	55.16
No. 2 Fdry, Birmingham ..	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld., Cin.	70.20	70.20	70.20	70.20	60.58
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton† ..	245.00	245.00	245.00	245.00	190.00

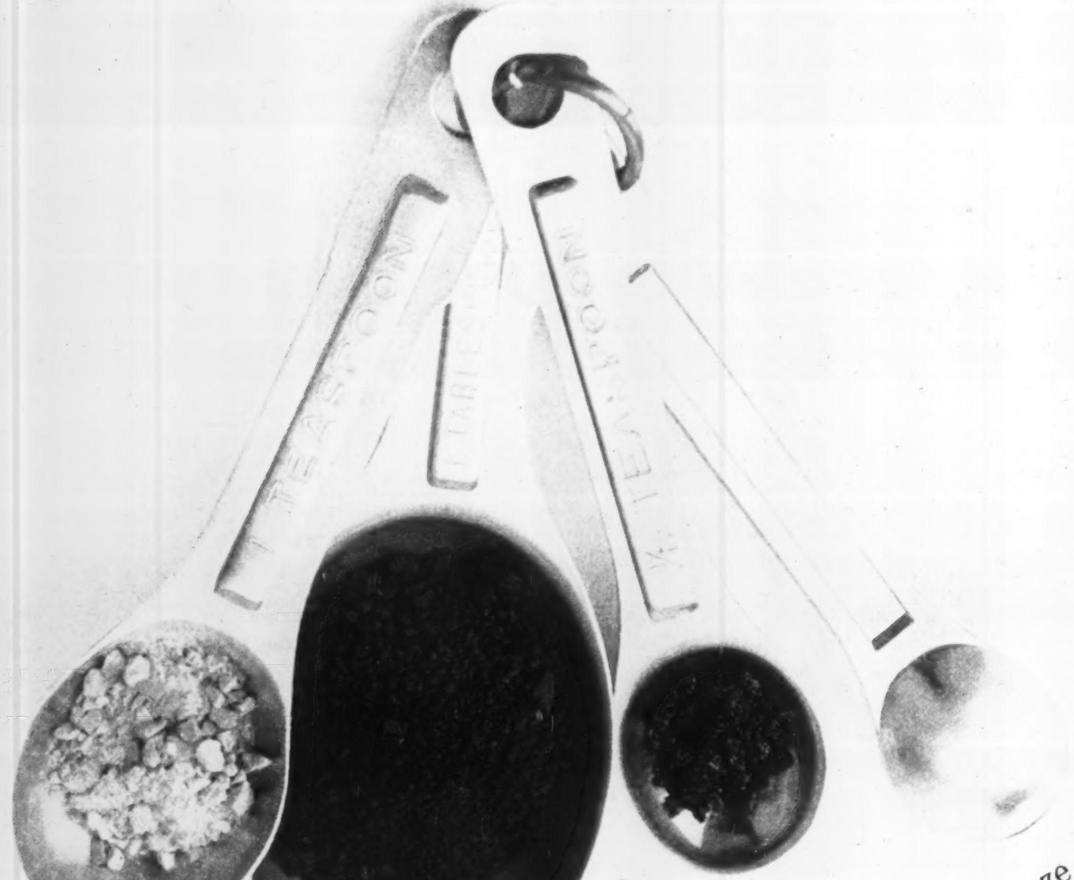
†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

SCRAP, Gross Ton	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
No. 1 Heavy Melt, Pittsburgh	$41.50	$40.50	$45.50	$41.50	$32.50
No. 1 Heavy Melt, E. Pa. .	45.00	45.00	45.00	34.00	32.25
No. 1 Heavy Melt, Chicago	42.00	42.50	45.50	42.00	33.00
No. 1 Heavy Melt, Valley ..	43.50	43.50	44.50	42.50	34.50
No. 1 Heavy Melt, Cleve. ..	40.50	40.50	41.50	39.00	32.50
No. 1 Heavy Melt, Buffalo .	33.50	33.50	33.50	33.50	30.50
Rails, Rerolling, Chicago ...	61.50	64.50	64.50	63.50	52.50
No. 1 Cast, Chicago	54.50	56.50	57.50	45.50	39.50

COKE, Net Ton

COKE, Net Ton	Dec. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Beehive, Furn., Connlsvl. ..	$15.00	$15.00	$15.00	$15.25	$13.75
Beehive, Fdry., Connlsvl. ..	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee ...	32.00	32.00	32.00	30.50	25.25



That's exactly what Inland's technical chefs will do when its giant, new sintering plant is completed in June. A single day's mix—4300 tons of iron ore particles, 500 tons of crushed limestone, 250 tons of fine coke—will bake a cake of clinkers which can be fed directly into blast furnaces. Result—better, faster reduction of raw iron ore to pig iron, blast furnace production upped 10%—*more and more Inland steel to feed the hungry production lines of fast-expanding Mid-America manufacturing!*

Building Today with an Eye to Tomorrow

INLAND

INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois
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Kansas City • Milwaukee • New York • St. Louis • St. Paul

Other Members of the Inland Family
JOSEPH T. RYERSON & SON, INC.
INLAND STEEL PRODUCTS COMPANY
INLAND STEEL CONTAINER COMPANY*
INLAND LIME & STONE COMPANY* *Division*

Steel Prices

Mill prices as reported to STEEL, Dec. 9, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 146; footnotes, page 148.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$76.00

INGOTS, Alloy (NT)

Detroit S41	$82.00
Economy,Pa. B14	82.00
Farrell,Pa. S3	82.00
Lowellville,O. S3	82.00
Midland,Pa. C18	82.00
Munhall,Pa. U5	82.00
Sharon,Pa. S3	82.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Bartonville,Ill. K4	$82.00
Bessemer,Pa. U5	80.00
Buffalo R2	80.00
Clairton,Pa. U5	80.00
Ensley,Ala. T2	80.00
Fairfield,Ala. T2	80.00
Fontana,Calif. K1	90.50
Gary,Ind. U5	80.00
Johnstown,Pa. B2	80.00
Lackawanna,N.Y. B2	80.00
Munhall,Pa. U5	80.00
Owensboro,Ky. G8	80.00
S.Chicago,Ill. R2, U5	80.00
S.Duquesne,Pa. U5	80.00
Sterling,Ill. N15	80.00
Youngstown R2	80.00

Carbon, Forging (NT)

Bessemer,Pa. U5	$99.50
Buffalo R2	99.50
Canton,O. R2	102.00
Clairton,Pa. U5	99.50
Conshohocken,Pa. A3	104.50
Ensley,Ala. T2	99.50
Fairfield,Ala. T2	99.50
Farrell,Pa. S3	99.50
Fontana,Calif. K1	109.00
Gary,Ind. U5	99.50
Geneva, Utah C11	99.50
Houston S5	104.50
Johnstown,Pa. B2	99.50
Lackawanna,N.Y. B2	99.50
LosAngeles B3	109.00
Midland,Pa. C18	99.50
Munhall,Pa. U5	99.50
Owensboro,Ky. G8	99.50
Seattle B3	109.00
Sharon,Pa. S3	99.50
S.Chicago R2, U5, W14	99.50
S.Duquesne,Pa. U5	99.50
S.SanFrancisco B3	109.00
Warren,O C17	99.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$119.00
Bridgeport,Conn. C32	119.00
Buffalo R2	119.00
Canton,O. R2, T7	119.00
Conshohocken,Pa. A3	126.00
Detroit S41	119.00
Economy,Pa. B14	119.00
Farrell,Pa. S3	119.00
Fontana,Calif. K1	140.00
Gary,Ind. U5	119.00
Houston S5	124.00
Ind.Harbor,Ind. Y1	119.00
Johnstown,Pa. B2	119.00
Lackawanna,N.Y. B2	119.00
LosAngeles B3	139.00
Lowellville,O. S3	119.00
Massillon,O. R2	119.00
Midland,Pa. C18	119.00
Munhall,Pa. U5	119.00
Owensboro,Ky. G8	119.00
Sharon,Pa. S3	119.00
S.Chicago R2,U5,W14	119.00
S.Duquesne,Pa. U5	119.00
Struthers,O. Y1	119.00
Warren,O. C17	119.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$122.50
Canton,O. R2	125.00
Cleveland R2	122.50
Gary,Ind. U5	122.50
S.Chicago,Ill. R2 W14	122.50
S.Duquesne,Pa. U5	122.50
Warren,O. C17	122.50

SKELP

Aliquippa,Pa. J5	5.05
Munhall,Pa. U5	5.05
Pittsburgh J5	5.05
Warren,O. R2	5.05
Youngstown R2, U5	5.05

WIRE RODS

AlabamaCity, Ala. R2	6.40
Aliquippa,Pa. J5	6.40
Alton,Ill. L1	6.60
Bartonville,Ill. K4	6.50
Buffalo W12	6.40
Cleveland A7	6.40
Donora,Pa. A7	6.40
Fairfield,Ala. T2	6.40
Houston S5	6.65
IndianaHarbor,Ind. Y1	6.40
Johnstown,Pa. B2	6.40
Joliet,Ill. A7	6.40
KansasCity,Mo. S5	6.65
Kokomo,Ind. C16	6.50
LosAngeles B3	7.20
Minnequa,Colo. C10	6.65
Monessen,Pa. P7	6.40
Pittsburg,Calif. C11	7.20
Portsmouth,O. P12	6.40
Roebling,N.J. R5	6.50
S.Chicago,Ill. R2, W14	6.40
SparrowsPoint,Md. B2	6.50
Sterling,Ill.(1) N15	6.40
Sterling,Ill. N15	6.50
Struthers,O. Y1	6.40
Worcester,Mass. A7	6.70

STRUCTURALS

Carbon Steel Std. Shapes

AlabamaCity,Ala. R2	5.50
Aliquippa,Pa. J5	5.50
Atlanta A11	5.70
Bessemer,Ala. T2	5.50
Bethlehem,Pa. B2	5.55
Birmingham C15	5.50
Clairton,Pa. U5	5.50
Fairfield,Ala. T2	5.50
Fontana,Calif. K1	6.30
Gary,Ind. U5	5.50
Geneva,Utah C11	5.50
Houston S5	5.60
Ind.Harbor,Ind. I-2, Y1	5.50
Johnstown,Pa. B2	5.55
Joliet,Ill. P22	5.50
KansasCity,Mo. S5	5.60
Lackawanna,N.Y. B2	5.55
Los Angeles B3	6.20
Minnequa,Colo. C10	5.80
Munhall,Pa. U5	5.50
Niles,Calif. P1	6.25
Phoenixville,Pa. P4	5.55
Portland,Oreg. O4	6.25
Seattle B3	6.25
S.Chicago,Ill. U5, W14	5.50
S.SanFrancisco B3	6.15
Sterling,Ill. N15	5.50
Torrance,Calif. C11	6.20
Weirton,W.Va. W6	5.50

Wide Flange

Bethlehem,Pa. B2	5.55
Clairton,Pa. U5	5.50
Fontana,Calif. K1	6.45
IndianaHarbor,Ind. I-2	5.50
Lackawanna,N.Y. B2	5.55
Munhall,Pa. U5	5.50
Phoenixville,Pa. P4	5.55
S.Chicago,Ill. U5	5.50
Sterling,Ill. N15	5.50
Weirton,W.Va. W16	5.50

Alloy Std. Shapes

Aliquippa,Pa. J5	6.80
Clairton,Pa. U5	6.80
Gary,Ind. U5	6.80
Houston S5	6.90
Munhall,Pa. U5	6.80
S.Chicago,Ill. U5, W14	6.80

H.S., L.A., Std. Shapes

Aliquippa,Pa. J5	8.05
Bessemer,Ala. T2	8.05
Bethlehem,Pa. B2	8.10
Clairton,Pa. U5	8.05
Fairfield,Ala. T2	8.05
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.05
Geneva,Utah C11	8.05
Houston S5	8.15
Ind.Harbor,Ind. I-2, Y1	8.05
Johnstown,Pa. B2	8.10
KansasCity,Mo. S5	8.15
Lackawanna,N.Y. B2	8.10
LosAngeles B3	8.75
Munhall,Pa. U5	8.05
Seattle B3	8.80
S.Chicago,Ill. U5, W14	8.05
S.SanFrancisco B3	8.70
Sterling,Ill. N15	7.75
Struthers,O. Y1	8.05

H.S., L.A., Wide Flange

Bethlehem,Pa. B2	8.10
Ind.Harbor,Ind. I-2	8.05
Lackawanna,N.Y. B2	8.10
Munhall,Pa. U5	8.05
S.Chicago,Ill. U5	8.05
Sterling,Ill. N15	7.75

PILING

BEARING PILES

Bethlehem,Pa. B2	5.55
Ind.Harbor,Ind. I-2	5.50
Lackawanna,N.Y. B2	5.55
Munhall,Pa. U5	5.50
S.Chicago,Ill. I-2, U5	5.50

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	6.50
Lackawanna,N.Y. B2	6.50
Munhall,Pa. U5	6.50
S.Chicago,Ill. I-2, U5	6.50
Weirton,W.Va. W6	6.50

PLATES

PLATES, Carbon Steel

AlabamaCity,Ala. R2	5.30
Aliquippa,Pa. J5	5.30
Ashland,Ky.(15) A10	5.30
Atlanta A11	5.50
Bessemer,Ala. T2	5.30
Clairton,Pa. U5	5.30
Claymont,Del. C22	5.30
Cleveland J5, R2	5.30
Coatesville,Pa. L7	5.30
Conshohocken,Pa. A3	5.30
Ecorse,Mich. G5	5.30
Fairfield,Ala. T2	5.30
Farrell,Pa. S3	5.30
Fontana,Calif.(30) K1	6.10
Gary,Ind. U5	5.30
Geneva,Utah C11	5.30
GraniteCity,Ill. G4	5.40
Harrisburg,Pa. P4	5.30
Houston S5	5.40
Ind.Harbor,Ind. I-2, Y1	5.30
Johnstown,Pa. B2	5.30
Lackawanna,N.Y. B2	5.30
Mansfield,O. E6	5.30
Minnequa,Colo. C10	6.15
Munhall,Pa. U5	5.30
Newport,Ky. A2	5.30
Pittsburgh J5	5.30
Riverdale,Ill. A1	5.30
Seattle B3	6.20
Sharon,Pa. S3	5.30
S.Chicago,Ill. U5 W14	5.30
SparrowsPoint,Md. B2	5.30
Sterling,Ill. N15	5.30
Steubenville,O. W10	5.30
Warren,O. R2	5.30
Youngstown U5, Y1	5.30
Youngstown(27) R2	5.30

PLATES, Carbon Abras. Resist.

Claymont,Del. C22	7.05
Fontana,Calif. K1	7.85
Geneva,Utah C11	7.05
Houston S5	7.15
Johnstown,Pa. B2	7.05
SparrowsPoint,Md. B2	7.05

PLATES, Wrought Iron

Economy,Pa. B14	13.55

PLATES, H.S., L.A.

Aliquippa,Pa. J5	7.95
Ashland,Ky. A10	7.95
Bessemer,Ala. T2	7.95
Clairton,Pa. U5	7.95
Claymont,Del. C22	7.95
Cleveland J5, R2	7.95
Coatesville,Pa. L7	7.95
Conshohocken,Pa. A3	7.95
Economy,Pa. B14	7.95
Ecorse,Mich. G5	7.95
Fairfield,Ala. T2	7.95
Farrell,Pa. S3	7.95
Fontana,Calif.(30) K1	8.75
Gary,Ind. U5	7.95
Geneva,Utah C11	7.95
Houston S5	8.05
Ind.Harbor,Ind. I-2, Y1	7.95
Johnstown,Pa. B2	7.95
Munhall,Pa. U5	7.95
Pittsburgh J5	7.95
Seattle B3	8.85
Sharon Pa. S3	7.95
S.Chicago,Ill. U5, W14	7.95
SparrowsPoint,Md. B2	7.95
Warren,O. R2	7.95
Youngstown U5, Y1	7.95

PLATES, Alloy

Aliquippa,Pa. J5	7.50
Claymont,Del. C22	7.50
Coatesville,Pa. L7	7.50
Economy,Pa. B14	7.50
Farrell,Pa. S3	7.50
Fontana,Calif. K1	8.30
Gary,Ind. U5	7.50
Houston S5	7.60
Ind.Harbor,Ind. Y1	7.50
Johnstown,Pa. B2	7.50
Lowellville,O. S3	7.50
Munhall Pa. U5	7.50
Newport,Ky. A2	7.50
Pittsburgh J5	7.50
Seattle B3	8.40
Sharon,Pa. S3	7.50
S.Chicago Ill. U5, W14	7.50
SparrowsPoint,Md. B2	7.50
Youngstown Y1	7.50

FLOOR PLATES

Cleveland J5	6.375
Conshohocken,Pa. A3	6.375
Ind.Harbor,Ind. I-2	6.375
Munhall,Pa. U5	6.375
Pittsburgh J5	6.375
S.Chicago,Ill. U5	6.375

PLATES, Ingot Iron

Ashland c.l. (15) A10	5.55
Ashland l.c.l. (15) A10	6.05
Cleveland c.l. R2	6.05
Warren,O. c.l. R2	6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2	5.675
Aliquippa,Pa. (9) J5	5.675
Alton,Ill. L1	5.875
Atlanta(9) A11	5.875
Bessemer,Ala.(9) T2	5.675
Birmingham(9) C15	5.675
Buffalo(9) R2	5.675
Canton,O.(23) R2	6.15
Clairton,Pa. (9) U5	5.675
Cleveland(9) R2	5.675
Ecorse,Mich.(9) G5	5.675
Emeryville,Calif. J7	6.425
Fairfield,Ala.(9) T2	5.675
Fairless,Pa.(9) U5	5.825
Fontana,Calif.(9) K1	6.375
Gary,Ind.(9) U5	5.675
Houston(9) S5	5.925
Ind.Harbor(9) I-2, Y1	5.675
Johnstown,Pa.(9) B2	5.675
Joliet,Ill. P2	5.675
KansasCity,Mo.(9) S5	5.925
Lackawanna(9) B2	5.675
LosAngeles(9) B3	6.375
Massillon,O.(23) R2	6.15
Midland,Pa.(23) C18	6.025
Milton,Pa. M18	5.825
Minnequa,Colo. C10	6.125
Niles Calif. P1	6.375
Owensboro,Ky.(9) G8	6.025
Pittsburg,Calif.(9) C11	6.375
Pittsburgh(9) J5	5.675
Portland,Oreg. O4	6.425
Riverdale,Ill.(9) A1	5.675
Seattle A24, B3, N14	6.425
S.Ch'c'go(9)R2,U5,W14	5.675
S.Duquesne,Pa.(9) U5	5.675
S.SanFran.,Calif.(9)B3	6.425
Sterling,Ill.(1)(9) N15	5.675
Sterling,Ill.(9) N15	5.775
Struthers,O.(9) Y1	5.675
Tonawanda,N.Y. B12	5.675
Torrance Calif.(9) C11	6.375
Warren,O. C17	6.052
Youngstown(9) R2,U5	5.675

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5	6.725
Bethlehem,Pa. B2	6.725
Bridgeport,Conn. C32	6.80
Buffalo R2	6.725
Canton,O. R2, T7	6.725
Clairton,Pa. U5	6.275
Detroit S41	6.725
Economy,Pa. B14	6.725
Ecorse,Mich. G5	6.725
Fairless,Pa. U5	6.875
Farrell,Pa. S3	6.725
Fontana,Calif. K1	7.775
Gary,Ind. U5	6.725
Houston S5	6.975
Ind.Harbor,Ind. I-2, Y1	6.725
Johnstown,Pa. B2	6.725
KansasCity,Mo. S5	6.975
Lackawanna,N.Y. B2	6.725
LosAngeles B3	7.775
Lowellville,O. S3	6.725
Massillon,O. R2	6.725
Midland,Pa. C18	6.725
Owensboro,Ky. G8	6.725
Pittsburgh J5	6.725
Sharon,Pa. S3	6.725
S.Chicago R2, U5, W14	6.725
S.Duquesne,Pa. U5	6.725
Struthers,O. Y1	6.725
Warren,O. C17	6.725
Youngstown U5	6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy

Aliquippa,Pa. J5	8.30
Bessemer,Ala. T2	8.30
Bethlehem,Pa. B2	8.30
Clairton,Pa. U5	8.30
Cleveland R2	8.30
Ecorse,Mich. G5	8.30
Fairfield,Ala. T2	8.30
Fontana,Calif. K1	9.00
Gary,Ind. U5	8.30
Houston S5	8.55
Ind.Harbor,Ind. Y1	8.30
Johnstown,Pa. B2	8.30
KansasCity,Mo. S5	8.55
Lackawanna,N.Y. R2	8.30
LosAngeles B3	9.00
Pittsburgh J5	8.30
Seattle B3	9.05
S.Chicago,Ill. R2, W14	8.30
S.Duquesne,Pa. U5	8.30
S.SanFrancisco B3	9.05
Struthers,O. Y1	8.30
Youngstown U5	8.30

BAR SIZE ANGLE; H.R. Carbon

Bethlehem Pa.(9) B2	5.825
Houston(9) S5	5.925
KansasCity,Mo.(9)S5	5.925
Lackawanna(9) B2	5.675
Sterling,Ill. N15	5.775
Sterling,Ill.(1) N15	5.675
Tonawanda,N.Y. B12	5.675

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	5.675
Atlanta A11	5.875
Joliet,Ill. P22	5.675
Minnequa,Colo. C10	6.125
Niles,Calif. P1	6.375
Pittsburgh J5	5.675
Portland,Oreg. O4	6.425
SanFrancisco S7	6.52
Seattle B3	6.425

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5	6.80
Clairton,Pa. U5	6.80
Gary,Ind. U5	6.80
Houston S5	7.05
KansasCity,Mo. S5	7.05
Pittsburgh J5	6.80
Youngstown U5	6.80

BARS, C.F. Leaded (Including leaded extra)

Carbon

LosAngeles P2, S30	11.75*

Alloy

Ambridge,Pa. W18	10.175
BeaverFalls,Pa. M12	10.175
Camden,N.J. P13	10.35
Chicago W18	10.175
Elyria,O. W8	10.175
Monaca,Pa. S17	10.175
Newark,N.J. W18	10.35
SpringCity,Pa. K3	10.35

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*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	7.65
BeaverFalls,Pa. M12,R2	7.65
Birmingham C15	8.25
Buffalo B5	7.70
Camden,N.J. P13	8.10
Carnegie,Pa. C12	7.65
Chicago W18	7.65
Cleveland A7, C20	7.65
Detroit B5, P17	7.85
Detroit S41	7.65
Donora,Pa. A7	7.65
Elyria,O. W8	7.65
FranklinPark,Ill. N5	7.65
Gary,Ind. R2	7.65
GreenBay,Wis. F7	7.65
Hammond,Ind. J5, L2	7.65
Hartford,Conn. R2	8.15
Harvey,Ill. B5	7.65
LosAngeles(49) S30	9.10
LosAngeles(49) P2, R2	9.10
Mansfield,Mass. B5	8.20
Massillon,O. R2, R8	7.65
Midland Pa. C18	7.65
Monaca,Pa. S17	7.65
Newark,N.J. W18	8.10
NewCastle,Pa.(17) B4	7.65
Pittsburgh J5	7.65
Plymouth,Mich. P5	7.90
Putnam,Conn. W18	8.20
Readville,Mass. C14	8.20
S.Chicago,Ill. W14	7.65
SpringCity,Pa. K3	8.10
Struthers,O. Y1	7.65
Warren,O. C17	7.65
Waukegan,Ill. A7	7.65
Willimantic,Conn. J5	8.15
Youngstown F3, Y1	7.65

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19	6.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	9.025
BeaverFalls,Pa.M12,R2	9.025
Bethlehem,Pa. B2	9.025
Bridgeport,Conn. C32	9.175
Buffalo B5	9.025
Camden,N.J. P13	9.20
Canton,O. T7	9.025
Carnegie,Pa. C12	9.025
Chicago W18	9.025
Cleveland A7, C20	9.025
Detroit B5, P17	9.225
Detroit S41	9.025
Donora,Pa. A7	9.025
Elyria,O. W8	9.025
FranklinPark,Ill. N5	9.025
Gary,Ind. R2	9.025
GreenBay,Wis. F7	9.025
Hammond,Ind. J5, L2	9.025
Hartford,Conn. R2	9.325
Harvey,Ill. R5	9.025
Lackawanna,N.Y. B2	9.025
LosAngeles P2, S30	11.00
Mansfield,Mass. B5	9.325
Massillon,O. R2, R8	9.025
Midland,Pa. C18	9.025
Monaca,Pa. S17	9.025
Newark,N.J. W18	9.20
Plymouth,Mich. P5	9.225
S.Chicago,Ill. W14	9.025
SpringCity,Pa. K3	9.20
Struthers,O. Y1	9.025
Warren,O. C17	9.025
Waukegan,Ill. A7	9.025
Willimantic,Conn. J5	9.325
Worcester,Mass. A7	9.325
Youngstown F3, Y1	9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2	5.675
Atlanta A11	5.675
Birmingham C15	5.675
Buffalo R2	5.675
Cleveland R2	5.675
Ecorse,Mich. G5	5.675
Emeryville,Calif. J7	6.425
Fairfield,Ala. T2	5.675
Fairless,Pa. U5	5.825
Fontana,Calif. K1	6.375
Ft.Worth,Tex(4)(26)T4	5.925
Gary,Ind. U5	5.675
Houston S5	5.925
Ind.Harbor,Ind. I-2,Y1	5.675
Johnstown,Pa. B2	5.675
Joliet,Ill. P22	5.675
KansasCity,Mo. S5	5.925
Kokomo,Ind. C16	5.775
Lackawanna,N.Y. B2	5.675
LosAngeles B3	6.375
Madison,Ill. L1	5.875
Milton,Pa. M18	5.825
Minnequa,Colo. C10	6.125
Niles,Calif. P1	6.375
Pittsburg,Calif. C11	6.375
Pittsburgh J5	5.675
Portland,Oreg. O4	6.425
SandSprings,Okla. S5	5.925
Seattle A24, B3, N14	6.425
S.Chicago,Ill. R2, W14	5.675
S.Duquesne,Pa. U5	5.675
S.SanFrancisco B3	6.425
SparrowsPoint,Md. B2	5.675
Sterling,Ill. (1) N15	5.675
Sterling,Ill. N15	5.775
Struthers,O. Y1	5.675
Tonawanda,N.Y. B12	6.10
Torrance,Calif. C11	6.375
Youngstown R2, U5	5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2	7.42
Boston B2, U8	8.15
Chicago U8	7.41
Cleveland U8	7.39
Houston S5	7.60
Johnstown,Pa. B2	7.33
KansasCity,Mo. S5	7.60
Lackawanna, N.Y. B2	7.35
Marion,O. P11	6.70
Newark,N.J. U8	7.80
Philadelphia U8	7.63
Pittsburgh J5, U8	7.35
SandSprings,Okla. S5	7.60
Seattle A24, B3, N14	7.95
SparrowsPt.,Md. B2	7.33
St.Paul U8	8.17
Williamsport,Pa. S19	7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14	14.90
Economy,Pa.(D.R.)B14	18.55
Economy(Staybolt)B14	19.00
McK.Rks.(S.R.) L5	14.50
McK.Rks.(D.R.) L5	19.80
McK.Rks.(Staybolt)L5	20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2	5.575
ChicagoHts.(4)(44) I-2	5.675
ChicagoHts. (4) C2	5.675
Franklin,Pa. (3) F5	5.575
Franklin,Pa.(4) F5	5.675
JerseyShore,Pa.(3) J8	5.55
Marion,O. (3) P11	5.575
Tonawanda(3) B12	5.575
Tonawanda(4) B12	6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2	5.10
Allenport,Pa. P7	5.10
Aliquippa,Pa. J5	5.10
Ashland,Ky.(8) A10	5.10
Cleveland J5, R2	5.10
Conshohocken,Pa. A3	5.15
Detroit(8) M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Fairless,Pa. U5	5.15
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Geneva,Utah C11	5.20
GraniteCity,Ill.(8) G4	5.20
Ind.Harbor,Ind. I-2, Y1	5.10
Irvin,Pa. U5	5.10
Lackawanna,N.Y. B2	5.10
Mansfield,O. E6	5.10
Munhall,Pa. U5	5.10
Newport,Ky. A2	5.10
Niles,O. M21, S3	5.10
Pittsburg,Calif. C11	5.80
Pittsburgh J5	5.10
Portsmouth,O. P12	5.10
Riverdale,Ill. A1	5.10
Sharon,Pa. S3	5.10
S.Chicago,Ill. U5, W14	5.10
SparrowsPoint,Md. B2	5.10
Steubenville,O. W10	5.10
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5, Y1	5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3	6.275

SHEETS, H.R., Alloy

Gary,Ind. U5	8.40
Ind.Harbor,Ind. Y1	8.40
Irvin,Pa. U5	8.40
Munhall,Pa. U5	8.40
Newport,Ky. A2	8.40
Youngstown U5, Y1	8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5	7.525
Ashland,Ky. A10	7.525
Cleveland J5, R2	7.525
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.525
Fairfield,Ala. T2	7.525
Fairless,Pa. U5	7.575
Farrell,Pa. S3	7.525
Fontana,Calif. K1	8.25
Gary,Ind. U5	7.525
Ind.Harbor,Ind. I-2, Y1	7.525
Irvin,Pa. U5	7.525
Lackawanna(35) B2	7.525
Munhall,Pa. U5	7.525
Niles,O. S3	7.525
Pittsburgh J5	7.525
S.Chicago,Ill. U5, W14	7.525
Sharon,Pa. S3	7.525
SparrowsPoint(36) B2	7.525
Warren,O. R2	7.525
Weirton,W.Va. W6	7.525
Youngstown U5, Y1	7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10	5.35
Cleveland R2	5.875
Warren,O. R2	5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	7.05
Middletown,O. A10	6.775
Warren,O. R2	7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2	6.275
Aliquippa,Pa. J5	6.275
Allenport,Pa. P7	6.275
Cleveland J5, R2	6.275
Conshohocken,Pa. A3	6.325
Detroit M1	6.275
Ecorse,Mich. G5	6.275
Fairfield,Ala. T2	6.275
Fairless,Pa. U5	6.325
Follansbee,W.Va. F4	6.275
Fontana,Calif. K1	7.40
Gary,Ind. U5	6.275
GraniteCity,Ill. G4	6.375
Ind.Harbor,Ind. I-2, Y1	6.275
Irvin,Pa. U5	6.275
Lackawanna,N.Y. B2	6.275
Mansfield,O. E6	6.275
Middletown,O A10	6.275
Newport,Ky. A2	6.275
Pittsburg,Calif. C11	7.225
Pittsburgh J5	6.275
Portsmouth,O. P12	6.275
SparrowsPoint,Md. B2	6.275
Steubenville,O. W10	6.275
Warren,O. R2	6.275
Weirton,W.Va. W6	6.275
Yorkville,O. W10	6.275
Youngstown Y1	6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5	9.275
Cleveland J5, R2	9.275
Ecorse,Mich. G5	9.275
Fairless,Pa. U5	9.325
Fontana,Calif. K1	10.40
Gary,Ind. U5	9.275
Ind.Harbor,Ind. I-2, Y1	9.275
Lackawanna(37) B2	9.275
Pittsburgh J5	9.275
SparrowsPoint(38) B2	9.275
Warren,O. R2	9.275
Weirton,W.Va. W6	9.275
Youngstown Y1	9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2	7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2	6.875‡
Ashland,Ky. A10	6.875‡
Canton,O. R2	6.875‡
Dover,O. E6	6.875†
Fairfield,Ala. T2	6.875†
Gary,Ind. U5	6.8.5†
GraniteCity,Ill. G4	6.975*
Ind.Harbor,Ind. I-2	6.875†
Irvin,Pa. U5	6.875†
Kokomo,Ind. C-16	6.975‡
MartinsFerry,O. W10	6.875*
Middletown,O. A10	6.875†
Pittsburg,Calif. C11	7.625*
Pittsburgh J5	6.875†
SparrowsPt.,Md. B2	6.875†
Warren,O. R2	6.875†
Weirton,W.Va. W6	6.875*

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*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1	7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5	10.125
Pittsburgh J5	10.125
SparrowsPt.(39) B2	10.025

SHEETS, Galvannealed Steel

Canton,O. R2	7.275
Irvin,Pa. U5	7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10	7.125
Middletown,O. A10	7.125

SHEETS, Electrogalvanized

Cleveland(28) R2	7.65
Niles,O.(28) R2	7.65
Weirton,W.Va. W6	7.50
Youngstown J5	7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1)	9.525
Butler,Pa. A10 (type 2)	9.625

SHEETS, Enameling Iron

Ashland,Ky. A10	6.775
Cleveland R2	6.775
Fairfield,Ala. T2	6.775
Gary,Ind. U5	6.775
Ind.Harbor,Ind. I-2, Y1	6.775
Irvin,Pa. U5	6.775
Middletown,O. A10	6.775
Niles,O. M21, S3	6.775
Youngstown Y1	6.775

BLUED STOCK, 29 Gage

Dover,O. E6	8.70
Follansbee,W.Va. F4	8.70
Ind.Harbor,Ind. I-2	8.70
Mansfield,O E6	8.70
Warren,O. R2	8.70
Yorkville,O. W10	8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10	7.225
Gary,Ind. U5	7.225
Mansfield,O. E6	7.225
Middletown,O. A10	7.225
Niles,O. M21, S3	7.225
Warren,O. R2	7.225
Weirton,W.Va. W6	7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	7.625

Key To Producers

A1	Acme Steel Co.
A2	Acme-Newport Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A5	Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6	American Shim Steel Co.
A7	American Steel & Wire Div., U. S. Steel Corp.
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A24	Alaska Steel Mills Inc.
B1	Babcock & Wilcox
B2	Bethlehem Steel Co.
B3	Bethlehem Steel Co., Pacific Coast Div.
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B8	Braeburn Alloy Steel
B9	Brainard Steel Div., Sharon Steel Corp.
B10	E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12	Buffalo Steel Corp.
B14	A. M. Byers Co.
B15	J. Bishop & Co.
C1	Calstrip Steel Corp.
C2	Calumet Steel Div., Borg-Warner Corp.
C4	Carpenter Steel Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia-Geneva Steel
C12	Columbia Steel & Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft.
C15	Connors Steel Div., H. K. Porter Co., Inc.
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
C22	Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23	Charter Wire Inc.
C24	G. O. Carlson Inc.
C32	Carpenter Steel of N.Eng.
D2	Detroit Steel Corp.
D4	Disston Div., H. K. Porter Co. Inc.
D6	Driver-Harris Co.
D7	Dickson Weatherproof Nail Co.
D8	Damascus Tube Co.
D9	Wilbur B. Driver Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E5	Elliott Bros. Steel Co.
E6	Empire-Reeves Steel Corp.
E10	Enamel Prod. & Plating
F2	Firth Sterling Inc.
F3	Fitzsimmons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div., Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
F7	Ft. Howard Steel & Wire
F8	Ft. Wayne Metals Inc.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
G8	Green River Steel Corp.
H1	Hanna Furnace Corp.
H7	Helical Tube Co.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div., Borg-Warner Corp.
I-6	Ivins Steel Tube Works
I-7	Indiana Steel & Wire Co.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
K7	Kenmore Metals Corp.
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Steel Co.
L6	Lone Star Steel Co.
L7	Lukens Steel Co.
L8	Leschen Wire Rope Div., H. K. Porter Co. Inc.
M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M6	Mercer Pipe Div., Sawhill Tubular Products
M8	Mid-States Steel & Wire
M12	Moltrup Steel Products
M14	McInnes Steel Co.
M16	Md. Fine & Specialty Wire Co. Inc.
M17	Metal Forming Corp.
M18	Milton Steel Div. Merritt-Chapman&Scott
M21	Mallory-Sharon Metals Corp.
M22	Mill Strip Products Co.
N1	National-Standard Co.
N2	National Supply Co.
N3	National Tube Div., U. S. Steel Corp.
N5	Nelsen Steel & Wire Co.
N6	New England High Carbon Wire Co.
N8	Newman-Crosby Steel
N14	Northwest. Steel Rolling Mills Inc.
N15	Northwestern S.&W. Co.
N20	Neville Ferro Alloy Co.
O4	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Steel Corp.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke&Chem.
P7	Pittsburgh Steel Co.
P11	Pollak Steel Co.
P12	Portsmouth Div., Detroit Steel Corp.
P13	Precision Drawn Steel
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., American Chain & Cable
P17	Plymouth Steel Corp.
P19	Pitts. Rolling Mills
P20	Prod. Steel Strip Corp.
P22	Phoenix Mfg. Co.
P24	Phil. Steel & Wire Corp.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling's Sons, John A.
R6	Rome Strip Steel Co.
R8	Reliance Div.,EatonMfg.
R9	Rome Mfg. Co.
R10	Rodney Metals Inc.
S1	Seneca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S4	Sharon Tube Co.
S5	Sheffield Div., Armco Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S12	Spencer Wire Corp.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S17	Superior Drawn Steel Co.
S18	Superior Steel Div., Copperweld Steel Co.
S19	Sweet's Steel Co.
S20	Southern States Steel
S23	Superior Tube Co.
S25	Stainless Welded Prod.
S26	Specialty Wire Co. Inc.
S30	Sierra Drawn Steel Corp.
S40	Seneca Steel Service
S41	Stainless & Strip Div., J&L Steel Corp.
S42	Southern Elec. Steel Co.
S43	Seymour Mfg. Co.
S44	Screw & Bolt Corp. of America
T2	Tenn. Coal & Iron Div., U. S. Steel Corp.
T3	Tenn. Products & Chemical Corp.
T4	Texas Steel Co.
T5	Thomas Strip Div., Pittsburgh Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div., Am. Rad. & Stan. San.
T13	Tube Methods Inc.
T19	Techalloy Co. Inc.
U3	Union Wire Rope Corp.
U4	Universal-Cyclops Steel
U5	United States Steel Corp.
U6	U. S. Pipe & Foundry
U7	Ulbrich Stainless Steels
U8	U. S. Steel Supply Div., U. S. Steel Corp.
U11	Union Carbide Metals Co.
U13	Union Steel Corp.
V2	Vanadium-Alloys Steel
V3	Vulcan-Kidd Steel Div., H. K. Porter Co.
W1	Wallace Barnes Steel Div., Associated Spring Corp.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W8	Western Automatic Machine Screw Co.
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel & Wire Co.
W14	Wisconsin Steel Div., International Harvester
W15	Woodward Iron Co.
W18	Wyckoff Steel Co.
Y1	Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5 10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5 15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5 10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8 60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6 60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5 10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport, Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8 325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8 325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5 35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. W10	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15 55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. S18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15 55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10 80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80
Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

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*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12 60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

			0.80C	1.05C	1.35C
Bristol,Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.85	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23.30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
New York W3	...	...	18.85	22.95	27.80
Palmer,Mass. W12	...	...	18.85	....	....
Trenton,N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	...	18.85	22.95	27.80
Youngstown S41	..	...	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)

Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TINPLATE, Hot Dipped Common Coke

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10 65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10 65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7 85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10 05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13 35	14.65
Brackenridge,Pa. A4	....	....	12.40	13 55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13 55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented					
	T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19 70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

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*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8 00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8 00
Chicago W13	8.00
Cleveland A7, C20	8 00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8 00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8 25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mas. W12	8.30
Pittsburg,Calif. C11	8 95
Portsmouth,O. P12	8 00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8 00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8 00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

Wire, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13 40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12 65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13 60
NewHaven,Conn. A7	12 95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12 95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10 05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10 05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N J. R5	10.05
S Chicago,Ill. R2	9.75
S SanFrancisco C10	10 70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving (8" Coils)

Alton,Ill L1	16 50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo S5	16 55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C16	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE

	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13 65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13 45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0 25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb kegs)	
Wheeling,W.Va. W10	$10.10

POLISHED STAPLES	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler

(14½ Ga.)(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.34

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.28
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.64

Coil. No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.69

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville B8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80††
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
KansCity(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(37)(48) N15	9.10	9.80
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)
½ in. and smaller:
  3 in. and shorter .. 55.0
  3¼ in. thru 6 in. .. 50.0
  Longer than 6 in. .. 37.0
⅝ in., 3 in. & shorter 47.0
  3¼ in. thru 6 in. ..40.0
  Longer than 6 in. .. 31.0
¾ in. thru 1 in.:
  6 in. and shorter .. 37.0
  Longer than 6 in. .. 31.0
1⅛ in. and larger:
  All lengths 31.0
Undersize Body (rolled thread)
½ in. and smaller:
  3 in. and shorter .. 55.0
  3¼ in. thru 6 in. .. 50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:
  6 in. and shorter .. 48.0
  Larger diameters and longer lengths ... 35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:
  6 in. and shorter .. 48.0
  Large diameters and longer lengths ... 35.0

High Tensile Structural Bolts

(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. (ASTM A-325, in bulk. Full keg quantity)
  ⅝ in. diam 50.0
  ¾ in. diam 47.0
  ⅞ and 1 in. diam.. 43.0
  1⅛ and 1¼ in. diam 34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:
  All sizes 56.0
(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:
  ¾ in. and smaller.. 62.0
  ⅞ in. to 1½ in., incl. 56.0
  1⅝ in. and larger.. 51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):
  ¾ in. and smaller.. 62.0
  ⅞ in. to 1½ in. incl. 56.0
  1⅝ in. and larger.. 51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):
  ⅞ in. and smaller.. 65.0
  1 in. to 1½ in., incl. 57.0
  1⅝ in. and larger.. 51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):
  ⅝ in. and smaller.. 62.0
  ¾ in. to ⅞ in., incl. 65.0
  1 in. to 1½ in., incl. 57.0
  1⅝ in. and larger.. 51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:
  ⅝ in. and smaller.. 35.0
  ¾, ⅞, and 1 in. .. 16.0
Longer than 6 in.:
  ⅝ in. and smaller.. 3.0
  ¾, ⅞, and 1 in. ..+11.0

High Carbon, Heat Treated:
6 in. and shorter:
  ⅝ in. and smaller.. 20.0
  ¾, ⅞, and 1 in. ..+ 5.0
Longer than 6 in.:
  ⅝ in. and smaller..+19.0
  ¾, ⅞, and 1 in. ..+39.0

Flat Head Cap Screws:
  ¾ in. and smaller,
  6 in. and shorter ..+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
  6 in. and shorter. ..+ 5.0
  Longer than 6 in. ..+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

⅞ in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.00	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	28.95	43.40	55.40	73.00	95.10
Pueblo,Colo. C10	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES	
Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS	
Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES	
Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated	
Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	15.35
Seattle B3	15.85

SCREW SPIKES	
Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES	
Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.75	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	—Plates— Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.80	$44.20

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*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

—Grade by Analysis (%)— W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward.Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda.N.Y. T9	....	66 50	67 00	67.50
Tonawanda.N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77 79	78.29	....
Rochester.N.Y., deld.	69.02	69.52	70.02	....
Syracuse.N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago.Ill. R2	66 00	66.50	66 50	67.00
S.Chicago.Ill. W14	66.00	....	66 50	67 00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon.Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron.Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro.Pa. B10	68.00	68.50	69.00	69.50
Chester.Pa. P4	68.00	68 50	69 00	....
Swedeland.Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark.N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy.N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland.Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks.Pa., deld.	....	67.60	67.60	68.13
Lawrenceville.Homestead, Wilmerding.Monaca.Pa., deld.	....	68.26	68.26	69.79
Verona.Trafford.Pa., deld.	68.29	68.82	68.82	69.35
Rrackenridge.Pa., deld.	68.60	69.10	69.10	69.63
Midland.Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard.Ohio Y1	....	....	66.50	....
Sharpsville.Pa. S6	66.00	....	66 50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield.Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66 00	66 50	66.50	67.00
Erie.Pa. I-3	66 00	66 50	66.50	67.00
Everett.Mass. E1	67.50	68.00	68.50	....
Fontana.Calif. K1	75.00	75.50	....	....
Geneva.Utah C11	66 00	66.50	....	....
GraniteCity.Ill. G4	67.90	68.40	68.90	....
Ironton.Utah C11	66.00	66.50	....	....
Minnequa.Colo. C10	68.00	68 50	69.00	....
Rockwood.Tenn. T3	....	62.50‡	66.50	....
Toledo.Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

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*Phos 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.03-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson.Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity.Ky. P15	$99.00
NiagaraFalls.N.Y. P15	99.00
Keokuk.Iowa Open-hearth & Fdry, K2	89.00
Keokuk.Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles.Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood.Tenn. T3 (Phos. 0.035% max)	73.00
Troy.N.Y. R2 (Phos. 0.075% max)	73.00
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036 0.075%)	71.00
Erie Pa. I-3 (Intermediate) (Phos. 0.036-0 075% max)	71.00
NevilleIsland.Pa P6 (Intermediate) (Phos 0 036-0 075% max).	71 00
Swedeland.Pa. A3 (Intermediate)(Phos. 0.036-0.075% max)	73.00

Steel Service Center Products

Representative prices, per pound. subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no change.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	9.80(a)	10.00(b)	10.06	....	11.45(c)	10.05(d)	11.80#	16.38	9.55	9.90(e)	10.50
Birmingham	9 43(a)	10 20(b)	....	....	10 91(c)	9.59(d)	13 14#	16 76	9 00	9 79(e)	10 90
Boston	10.07	11.42	11.77	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	11.25	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9 65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10 90	53.00	8.51	8.99	9.15	15.05	9 00	8.89	10.20
Cincinnati	8 43	9 51	10 95	53 43	8 83	9.31	11.58#	15.37	9.56	9.27	10 53
Cleveland	8.54(a)	8.79(b)	10.94	52.33	10.32(c)	8.75(d)	11.25#	15.16	9.39	8.71(e)	10.50(f)
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9 26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	9.65(a)	9.65(b)	....	52.00	10.85(c)	8.90(d)	13.10#	16.55	8.35	9.65(e)	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.82[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9 15	....	8.99	8.91	....
New York	9.17	10.49	11.35	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9 15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.89	52.17	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.54(a)	8.79(b)	10.76	52.33	10.30(c)	8.64(d)	11.25#	15.05	9.00	8.47(e)	10.26(f)
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.80(a)	9 31(b)	10.47	....	10.32(c)	8 70(d)	11 49#	16.54	9.38	8.60(e)	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10 15	13.60	16.25	9.85	10.00	12.35
Seattle	10 30	11 55	12.50	56.52	10.25	10 50	14.70	16.80[5]	10 20	10 10	12 50
South'ton, Conn.	9 07	10 33	10 71	....	9.48	9.74	....	....	9.57	9 57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10 20	10 10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

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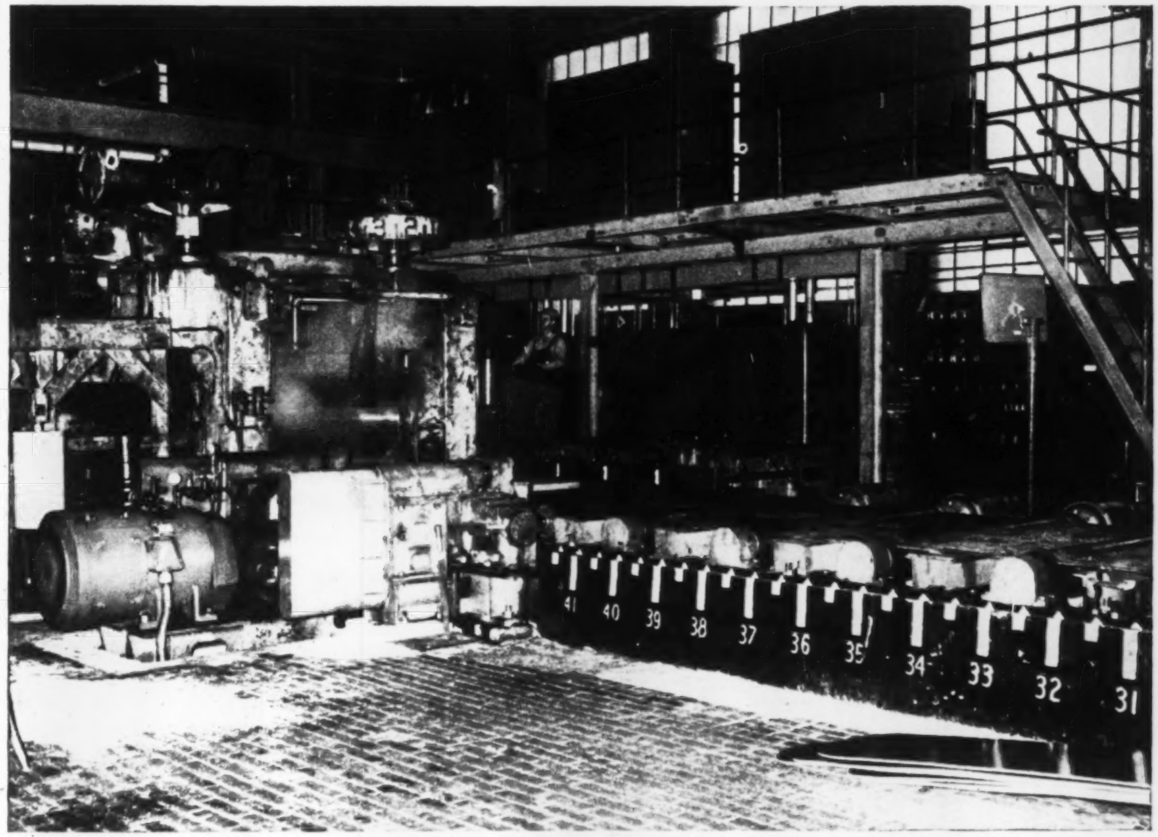
*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price. 1 in round C-1018.

(a)10 Ga.; (b)20 Ga.; (c)⅛ x 1 in.; (d)⅝-2$\frac{15}{16}$ in.; (e)½ x 84 in.; (f)¼ x 36 in.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10.000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30.000 lb and over; [2]—30.000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.



Packaged M-G sets and controls are located right at the hot mill in Revere Copper and Brass, Incorporated's New Bedford, Mass. plant

Reliance Packaged Drives cut Modernization Cost 20%

Instead of one large motor-generator set, Revere Copper and Brass, Incorporated used five packaged V★S Drives to power the edger and tables on their rebuilt hot mill.

Reliance Drives package the M-G sets with controls and put them right at the mill itself. Conduit runs are of minimum length, which reduced not only material costs but construction time.

Control installation was vastly simplified. Each V★S Unit was prewired and pretested before shipping. The complete V★S Cabinets had only to be set in place and connected. Extra construction was not required for a generator room.

Packaged V★S Drives cut costs for Revere and gave more flexibility of operation and greater ease of maintenance. Reliance Packaged Drives will reduce drive installation and operating costs for any type of mill.

For complete details contact your Reliance representative, or write today for Bulletin No. D-2506.

L-1586

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 412A, CLEVELAND 17, OHIO
Canadian Division: Toronto, Ontario
Sales Offices and Distributors in Principal Cities

Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo. Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thorton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

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*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid $26.50-$27; barge, Brownsville, Tex., $29-$29.50.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, $\frac{7}{32}$" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products	(Per Base Box; 100 lb basis wt)
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.50
100 mesh, pails	9.85§
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe.	36.75
Unannealed (99+% Fe)	33.25
Unannealed (99+% Fe) (minus 325 mesh)	58.25
Powder Flake (minus 16 plus 100 mesh)	29.25
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots	42.00*
Brass, 500-lb lots	35.70-52.20†
Bronze, 5000-lb lots	53.50-57.50†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic:	
Minus 35 mesh	$1.00
Nickel	$1.15
Nickel-Silver, 5000-lb lots	54.00-58.30†
Phosphor-Copper, 5000-lb lots	66.00
Copper (atomized) 5000-lb lots	46.50-55.00
Solder	7.00*
Silicon	70.00*
Stainless Steel, 304	89.00*
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	20.70-33.90‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom**
Chromium electrolytic 99.8% Cr, min, metallic basis	5.00

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*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes*	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.60	....	$6.55	$6.46	$6.95
Bar Size Angles	6.60	....	6.55	6.46	6.95
Structural Angles	5.93	....	5.88	5.78	6.18
I-Beams	5.93	....	5.88	5.78	6.18
Channels	5.93	....	5.88	5.78	6.18
Plates (basic bessemer)	6.30	....	6.25	6.15	6.55
Sheets, H.R.	9.50	....	9.45	9.35	9.75
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	10.40	....	10.35	10.25	10.75
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	10.55	....	10.50	10.40	10.80
Sheets, C.R. (drawing quality)	12.00	....	12.95	12.85	13.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	....	25.28	24.99	26.68
Barbed Wire (†)	8.25	....	8.20	8.10	8.50
Merchant Bars	6.58	....	6.53	6.44	6.81
Hot-Rolled Bands	9.90	....	9.85	8.75	10.15
Wire Rods, Thomas Commercial No. 5	6.40	....	6.40	6.25	6.60
Wire Rods, O. H.	6.90	....	6.90	6.75	7.10
Bright Common Wire Nails (§)	9.00	....	9.05	8.95	9.35

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*Books closed for 1959-60 shipping season. †Per 82 lb net reel. §Per 100-kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping seanson, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00†
Brazilian iron ore, 68.5%	21.00

Tungsten Ore

Net ton unit

Foreign wolframite, good commercial quality	$17.50-18.00*
Domestic, concentrates f.o.b. milling points	22.00-23.00

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*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 88-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$34.00-35.00†
48% no ratio	25.00-26.00†

South African Transvaal

44% no ratio	18.00†
48% no ratio	24.00-26.00†

Turkish

48% 3:1	36.00-37.00†

Domestic

Rail nearest seller

18% 3:1	30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.35-2.50
60-65%	2.60-3.20

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

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†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, oven	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

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*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg.	5.00
Toluene one deg (deld. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

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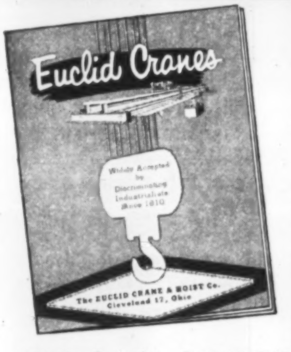
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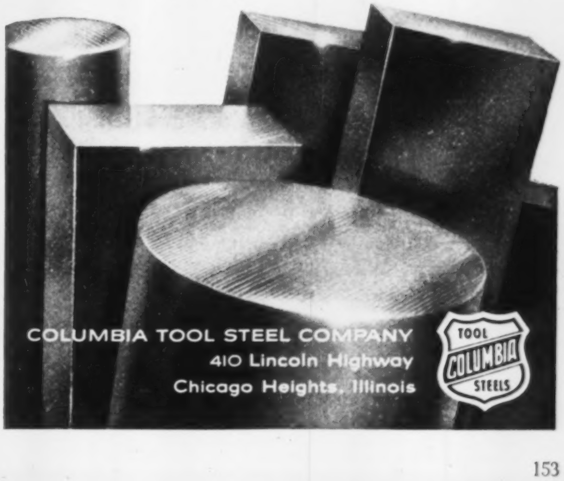

COLUMBIA TOOL STEEL COMPANY
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TOOL COLUMBIA STEELS

Scrap Resisting Further Decline

Prices are little changed at leading consuming centers in face of continued market softness. Mill buying is still limited despite soaring ingot operations

Scrap Prices, Page 156

• **Chicago**—The market continues soft and prices are being further deflated. Important steelmaking grades are off $1 a ton, while foundry and specialty grades are off $2 to $3. Despite a district steelmaking rate of 92.5 per cent, mills are either out of the market or buying sparingly.

• **Philadelphia**—Demand continues slow, with No. 2 heavy melting quoted lower at $39, delivered, No. 2 bundles at $28, structurals and plates at $50-$52, and drop broken machinery at $54-$55.

Exports are a little more encouraging. Japan recently contracted for 59 cargoes for shipment in the first quarter. About 530,000 tons are involved. The total is down sharply from that in the current quarter, during which period Japan was scheduled to take 89 cargoes, or 800,000 tons.

Two cargoes are now being loaded, and two more will likely leave this port before the end of the year.

• **New York** — Market sentiment leans toward the soft side, with domestic demand at a virtual standstill. Brokers' buying prices are lower at $36-$37 for No. 1 heavy melting and No. 1 bundles, and $32-$33 for No. 2 heavy melting.

• **Pittsburgh** — Recent mill purchases have steadied the market and relieved dealers' fears that prices would deteriorate until steelmakers settle with the union. A major independent paid $42 for No. 1 grades, $36-$37 for No. 2 heavy melting (depending on shipping point), and $31-$32 for No. 2 bundles. The following day, the district's biggest consumer bought an estimated 15,000 tons of No. 2 bundles at $32. B&O Railroad sold its scrap at prices averaging $2 a ton less than last month's. Some observers think prices are about as low as they're likely to fall. They anticipate an upturn as cold weather sets in.

• **Cleveland**—The market is standing still in the absence of representative mill buying, and quoted prices are largely nominal, both here and in the Valley. Uncertainty caused by the Taft-Hartley truce is thought to be a factor in the market sluggishness. Some observers think cold weather will stimulate buying, especially should prospects improve on the labor front.

• **Buffalo**—Secondary mill scrap has declined from $1 to $2 a ton on new mill orders. A leading consumer bought No. 2 heavy melting at $34, off $2 a ton, and No. 2 bundles at $28, off $1.

• **Detroit**—Dealers and brokers are

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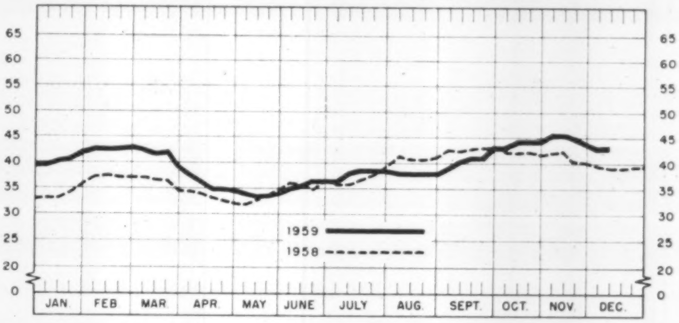
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL.



Dec. 9 1959	Week Ago	Month Ago	Year Ago	Nov. Avg.
$42.83	**$42.67**	**$45.33**	**$39.17**	**$44.33**

maintaining prices despite market sluggishness due to yearend inventory taxes and lack of mill interest.

- **Cincinnati** — Steelmaking grades dropped another $1 a ton as a local mill entered the market with a limited buying program. Brokers reduced their prices, bringing No. 1 heavy melting to $36-$37.

- **St. Louis** — Prices are still slipping. No. 1 and No. 2 heavy melting are off another $1 a ton, while No. 1 bundles and No. 1 busheling are down $2.50. No. 1 cupola is now quoted at $53, off $4 from a week ago.

The big mills are not buying, and there is not much demand of any kind for backed-up scrap. Railroad scrap is sluggish. Two offerings last week were withdrawn, one by the Missouri-Pacific, and the other by the Frisco.

- **Birmingham**—Price reductions on electric furnace scrap and a $2 a ton cut in prices on a railroad list indicate weakness in the market. Brokers expect other grades to slide when representative buys are made.

- **Houston** — The market has become something of a guessing game here, everything depending upon January exports and mill demand. Inland Texas prices were off $2 to $4 a ton at the start of the month on a purchase by the Lone Star mill. The border market also eased on projected Mexican needs.

Exporters still predict a decline in first quarter requirements. A Japanese metal bulletin, however, in a revised report of January-March requirements, reported Japan's A-group would import 489,000 tons from the U. S.

- **San Francisco** — The $40 price quoted on steel scrap may be on weak ground as the mills are not buying much at that level.

- **Los Angeles**—Dealers are looking for a decline in prices, though current buying by Kaiser Steel is keeping them up. A $1 a ton drop on No. 1 heavy melting and bundles is rumored as likely soon, but right now Kaiser is paying $41 for No. 1 material.

- **Seattle**—Dealers report little activity and unchanged prices. No export movement is reported, but Japanese buyers are negotiating for 58 cargoes for first quarter shipment.

Portland (Oreg.) market sources say prices there average higher than those in the Seattle area.

A Seattle firm is reported to have paid $41-$42, gross ton, on a sealed bid for about 2000 tons of material at the Umatilla, Oreg., ordnance depot.

Scrap Prices During 1959 Under 1947-49 Average

On the basis of Bureau of Labor Statistics data, average prices paid by steel mills and foundries for iron and steel scrap in the first ten months of 1959 were lower than the 1947-49 level, reports the Institute of Scrap Iron & Steel Inc.

It points out that the BLS scrap price index for the period January-October, 1959, was 98.6 (1947-49 = 100). The figures show that in five of the ten months the price average was below the 1947-49 level, as follows: April, 89.8; May, 85.8; June, 92.9; July, 97.6; August, 98.6.

The index stood at 101.6 in January, 106.1 in February, 102.0 in March, 102.6 in September, and 108.7 in October.

Pig Iron . . .

Pig Iron Prices, Page 150

Demand for merchant pig iron is declining, due in part to seasonal factors. Slowdown in automotive plant operations as a result of the steel shortage has caused a drop in demand for iron for making automotive castings. Blast furnace operators look for improved business in the first quarter, especially if another steel mill shutdown is avoided.

Farm implement production may not be as strong in 1960 as it was in 1959, but demand for castings from the industry will be high.

The Chester, Pa., blast furnace of Phoenix Steel Corp. resumed operations early in December following a suspension of several months.

U. S. Steel Corp. has taken off No. 5 furnace at its Gary (Ind.) Works for relining. That leaves 37 of the Chicago district's 43 stacks operating. Interlake Iron Corp. scheduled its "A" furnace at South Chicago, Ill., for resumption of production on Dec. 9. The unit had been undergoing repairs since the end of the steel strike.

Iron Ore . . .

Iron Ore Prices, Page 152

Resumption of shipping on the Great Lakes in November as result of the Taft-Hartley truce in the steel strike, brought a big hike in the Lake Superior iron ore movement during the month. The American Iron Ore Association reports shipments for November totaled 5,310,759 gross tons, up 4,214,309 tons compared with shipments of only 1,096,450 tons in October.

Indicative of shippers' efforts to

(Please turn to Page 16.

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Dec. 9, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Dec. 9	$42.83
Dec. 2	42.67
Nov. Avg.	44.33
Dec. 1958	39.47
Dec. 1954	32.58

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	35.00-36.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	31.00-32.00
No. 1 busheling	41.00-42.00
No. 1 factory bundles	51.00-52.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Cut structurals:	
2 ft and under	49.00-50.00
3 ft and under	48.00-49.00
Heavy turnings	35.00-36.00
Punchings & plate scrap	53.00-54.00
Electric furnace bundles	52.00-53.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	46.00-47.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	47.00-48.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
Rails, 2 ft and under	65.00-66.00
Rails, 18 in. and under	66.00-67.00
Random rails	60.00-61.00
Angles, splice bars	55.00-56.00
Railroad specialties	56.00-57.00
Rails, rerolling	66.00-67.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	43.00-44.00
No. 1 hvy melt., dealer	*40.00-41.00*
No. 2 hvy melting	*34.00-36.00*
No. 1 factory bundles	45.00-46.00
No. 1 dealer bundles	*40.00-41.00*
No. 2 bundles	*25.00-27.00*
No. 1 busheling, indus.	43.00-44.00
No. 1 busheling, dealer	*40.00-41.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut structurals, 3 ft	*48.00-49.00*
Punchings & plate scrap	*50.00-51.00*

Cast Iron Grades

No. 1 cupola	*54.00-55.00*
Stove plate	*48.00-49.00*
Unstripped motor blocks	*46.00-47.00*
Clean auto cast	*60.00-61.00*
Drop broken machinery	*60.00-61.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00-45.00*
R.R. malleable	*62.00-63.00*
Rails, 2 ft and under	*59.00-60.00*
Rails, 18 in. and under	*60.00-61.00*
Angles, splice bars	*54.00-55.00*
Axles	*58.00-60.00*
Rails, rerolling	*61.00-62.00*

Stainless Steel Scrap

18-8 bundles, solids	220.00-225.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	36.00-37.00
No. 1 busheling	47.00-48.00
No. 1 bundles	45.00-46.00
No. 2 bundles	29.00-30.00
Machine shop turnings	18.00-19.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	*48.00-49.00*
Electric furnace bundles	*48.00-49.00*

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

CLEVELAND

No. 1 heavy melting	40.00-41.00
No. 2 heavy melting	33.00-34.00
No. 1 factory bundles	46.00-47.00
No. 1 bundles	42.00-43.00
No. 2 bundles	26.00-27.00
No. 1 busheling	44.00-45.00
Machine shop turnings	16.00-17.00
Short shovel turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Cast iron borings	22.00-23.00
Cut foundry steel	*42.00-43.00*
Cut structurals, plate 2 ft and under	49.00-50.00
Low phos. punchings & plate	45.00-46.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	46.00-47.00

Cast Iron Grades

No. 1 cupola	55.00-56.00
Charging box cast	43.00-44.00
Heavy breakable cast	41.00-42.00
Stove plate	49.00-50.00
Unstripped motor blocks	39.00-40.00
Brake shoes	39.00-40.00
Clean auto cast	58.00-59.00
Burnt cast	47.00-48.00
Drop broken machinery	58.00-59.00

Railroad Scrap

R.R. malleable	*64.00-65.00*
Rails, 2 ft and under	*65.00-66.00*
Rails, 18 in. and under	*66.00-67.00*
Rails, random lengths	*59.00-60.00*
Cast steel	53.00-54.00
No. 1 railroad cast	58.50-59.50
Railroad specialties	*57.00-58.00*
Angles, splice bars	*57.00-58.00*
Rails, rerolling	74.00-75.00

Stainless Steel

(Brokers' buying prices: f.o.b. shipping point)

18-8 bundles, solids	*210.00-215.00*
18-8 turnings	110.00-115.00
430 clips, bundles, solids	*115.00-120.00*
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*35.00-37.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*42.00*
No. 2 bundles	24.00
No. 1 busheling	*42.00*
Machine shop turnings	20.00
Short shovel turnings	20.00

Cast Iron Grades

No. 1 cupola	*53.00*
Charging box cast	46.00
Heavy breakable cast	44.00
Unstripped motor blocks	45.00
Clean auto cast	56.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00
Rails, 18 in. and under	56.00
Rails, random lengths	51.00
Rails, rerolling	65.00
Angles, splice bars	50.00

BIRMINGHAM

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	37.00-38.00
No. 2 bundles	25.00-26.00
No. 1 busheling	*40.00-41.00*
Cast iron borings	14.00-15.00
Machine shop turnings	25.00-26.00
Short shovel turnings	28.00-29.00
Bar crops and plate	*46.00-47.00*
Structurals & plates	*45.00-46.00*
Electric furnace bundles	*40.00-41.00*
Electric furnace:	
3 ft and under	*39.00-40.00*
2 ft and under	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Charging box cast	29.00-30.00
Unstripped motor blocks	42.00-43.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
Rails, 18 in. and under	57.00-58.00
Rails, rerolling	61.00-62.00
Rails, random lengths	53.00-54.00
Angles, splice bars	50.00-51.00

PHILADELPHIA

No. 1 heavy melting	45.00
No. 2 heavy melting	*39.00*
No. 1 bundles	48.00
No. 2 bundles	*28.00*
No. 1 busheling	48.00
Electric furnace bundles	50.00
Mixed borings, turnings	21.00-22.00†
Shovel turnings	27.00
Machine shop turnings	24.00
Heavy turnings	35.00†
Structurals & plates	*50.00-52.00*
Couplers, springs, wheels	51.00
Rail crops, 2 ft & under	66.00-68.00

Cast Iron Grades

No. 1 cupola	45.00
Heavy breakable cast	48.00
Drop broken machinery	*54.00-55.00*
Malleable	68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	21.00-22.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.00-15.00
Shovel turnings	15.00-16.00
Low phos. structurals & plates	39.00-40.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	37.00-38.00

Stainless Steel

18-8 sheets, clips, solids	200.00-205.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	35.00-36.00
No. 1 bundles	39.00-40.00
No. 2 bundles	27.00-28.00
No. 1 busheling	39.00-40.00
Short shovel turnings	24.00-25.00
Machine shop turnings	20.00-21.00
Cast iron borings	22.00-23.00
Low phos structurals and plate, 2 ft and under	47.00-48.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	51.00-52.00

Railroad Scrap

Rails, random lengths	49.00-50.00
Rails, 3 ft and under	55.00-56.00
Railroad specialties	47.00-48.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*30.50-31.50*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*21.00-22.00*
Low phos. 18 in.	49.00-50.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Heavy breakable cast	44.00-45.00
Charging box cast	44.00-45.00
Drop broken machinery	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	63.00-64.00
Rails, random lengths	55.00-56.00

HOUSTON

(Exporters' buying prices; f.a.s)

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	37.00-38.00
No. 2 bundles	26.50-27.50

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00
No. 2 bundles	20.00†
Machine shop turnings	17.00
Short shovel turrnings	20.00
Low phos, plates & structurals	48.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable	35.00
Foundry malleable	43.00-44.00
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	25.50-26.50
No. 1 bundles	*36.00-37.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	*12.00-13.00*
Short shovel turnings	15.00-16.00
No. 1 cast	39.00-40.00
Mixed cupola cast	*37.00-38.00*
No. 1 machinery cast	40.00-43.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	39.00-40.00
No. 2 bundles	23.00-24.00
No. 1 busheling	36.00-37.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	14.00-15.00
Shovel turnings	15.00-16.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	40.00-41.00
Heavy breakable	40.00-41.00
Unstripped motor blocks	32.00-33.00
Charging box cast	40.00-41.00
Clean auto cast	53.00-54.00

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	32.00-33.00
No. 1 bundles	*32.00-33.00*
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

(Brokers' buying prices)

No. 1 heavy melting	*41.00*
No. 2 heavy melting	38.00
No. 1 bundles	39.00
No. 2 bundles	22.00
Machine shop turnings	18.00
Shovel turnings	20.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	40.00
No. 2 heavy melting	36.00
No. 1 bundles	36.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	44.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	24.00
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

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*Delivered to docks.

†Nominal.

‡F.o.b. Hamilton, Ont.

You specify the scrap you want... we'll fill the order

LOOK TO

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FOR DEPENDABLY
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AND ALLOY
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Pre-Christmas Pacts Seen

Settlements possible before holidays in both aluminum and copper. Aluminum prices will go up, perhaps even before a new contract is signed, to avoid inflation tag

Nonferrous Metal Prices, Pages 160 & 161

ODDS get better and better that before Christmas nonferrous union and management chiefs will reach new labor agreements spelling peace for the next two years.

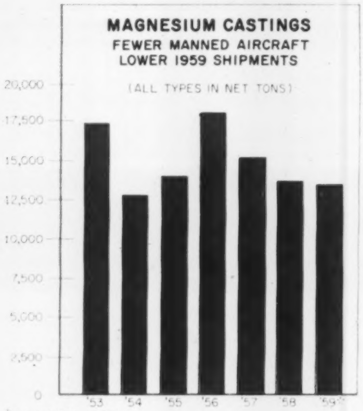
- **Copper on Verge**—The copper industry is on the verge of a widescale settlement. Late last week, American Smelting & Refining Co. had worked out terms with 12 of its copper, lead, and zinc facilities. Only the thirteenth, at Tacoma, Wash., was holding up ratification and a back to work order by the union, but it was expected that its objections would be overcome momentarily.

Meanwhile, Mine-Mill union officials have been surprisingly "bashful" about accepting an offer from Kennecott Copper Corp., identical to the one signed with the USW (see STEEL, Nov. 30, p. 163). Responsible for the holdup: Parts of the contract language, principally those dealing with "no strike" guarantees, and certain components (such as severance pay, health and welfare).

There are more and more indications that other copper producers are ready to submit similar packages to the union.

- **Aluminum Finally Moves**—The first signs that the aluminum companies and the unions are at last ready to talk seriously came last week when the major producers met in Chicago with the USW.

Possible: A pre-Christmas settlement patterned along the lines of the Kaiser Steel-USW agreement. It's unlikely negotiators will run into any major snags. There hasn't been the pressure in aluminum for a settlement that there has in other metals because the companies and unions have been operating under a contract extension agreement since early August. Now it appears neither side would have much to gain by delaying negotiations. Industry people are anxious to know just what their costs under a new contract are going to be since all wage gains are retroactive to Aug. 1.



*Estimated by STEEL
Source Magnesium Association

- **Prices Going Up**—One thing is certain. Prices are sure to rise. You may even see an advance before a settlement is reached because the aluminum companies don't want their price hike tagged with an inflation sticker.

Here's the situation: The primary price was cut 2 cents a pound in April, 1958. In August of that year, costs went up 0.7 cent a pound due to a cost of living adjustment and producers bumped quotations the same amount. So prices still remain 2 cents a pound under the early 1958 level. If the industry agrees to a new labor pact in the neighborhood of the Kaiser Steel settlement, it would raise per pound cost by about 1 cent. So to fully recoup the falling revenues brought on by lower prices and higher expenses, the industry would need a price advance of at least 3 cents a pound.

Such a hike in one jump is out of the question. But you can probably expect an early jump of 1 to 1.5 cents a pound, followed by one or two advances in 1960 of around 0.5 cent a pound.

Market Memos

- **Zinc Gains**—Paced by increased orders from galvanizers, domestic zinc shipments of 74,596 tons in November established the highest mark since June.

- **More Tin in '60** — Producing members of the International Tin Council will be allowed to export 36,000 tons in 1960's first quarter, about 95 per cent of their capacity. Some 30,000 tons will be exported this quarter.

- **Less Aluminum**—Until a short time ago, it appeared U. S. primary aluminum production would pass the 2 million ton mark this year for the first time. But recent production curtailments will probably hold U. S. output to slightly over 1.9 million tons, still the best year.

NONFERROUS PRICE RECORD

	Dec. 9 Price	Last Change	Previous Price	Nov. Avg	Oct. Avg	Dec., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	33.00	Nov. 12, 1959	31.50	32.420	31.278	28.856
Lead	12.80	Aug. 24, 1959	11.80	12.800	12.800	12.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	100.00	Dec. 9, 1959	99.50	100.985	102.231	99.019
Zinc	12.50	Nov. 2, 1959	12.50-13.00	12.500	12.259	11.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

ALCOA ALUMINUM
estimating and operating data

NEW! ANOTHER BIG BONUS IN ALCOA SCREW MACHINE STOCK

NOW! A COMPLETE ALUMINUM SCREW MACHINE STOCK BOOK FOR ESTIMATORS AND OPERATORS

The production of aluminum screw machine parts often calls for a lot of cross-reference table scrambling, complicated formulas to convert steel or brass to aluminum data, and time-consuming computations. Now Alcoa has the solution! For the first time in the screw machine industry, Alcoa makes available a comprehensive *Aluminum Handbook* for estimators and production people. The detailed estimator's section of this fact-filled booklet contains pages of tables to simplify your use of Alcoa® Aluminum. This extensive collection of data will make the toughest screw machining job a cinch to calculate.

Alcoa's handbook contains hundreds of conversions for aluminum screw machine stock, weights of various stock sizes, sfpm at various spindle speeds, weights of stock segments, thread tolerances and weights per 1,000 pieces, among other useful data you'll use every day.

There's also a complete section on *properties and specifications* of aluminum alloys that you'll find a handy reference. A *shop practice* section gives a quick solution for a host of work defects that occur in screw machining.

Your Alcoa man has reserved a copy of this handbook for you. Call the nearest Alcoa sales office or Alcoa Distributor today and he'll bring over your copy and show you how to cut hours off your work. Look for the Alcoa sales or distributor office in the Yellow Pages of your telephone directory under "Aluminum."

And don't forget these many additional bonuses when you deal with Alcoa:

- **Alcoa Aluminum Screw Machine Stock allows up to four times higher cutting speeds than other materials—up to 1,000 surface feet per minute.**
- **Wider range of sizes in standard stock for important price advantages.**
- **Stock in specific 12-ft lengths at no extra cost . . . in rounds to 3⅜ in. and hexagons to 3 in. across flats.**
- **Chamfered ends at no extra cost in a wide range of sizes and alloys.**
- **A guaranteed market for up to 60 per cent of your turnings and borings from four aluminum alloys.**
- **An extensive mill inventory to back up the nationwide distributor stocks and cover emergency requirements of mill customers.**

ALCOA ALUMINUM

Your Guide to the Best in Aluminum Value

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.40 per lb deld.

Cobalt: 99+ %, $1.75 per lb for 500-lb keg. $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 33.00 deld.; custom smelters, nom.; lake, 33.00 deld.; fire refined, 32.75 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloy: AZ91A (diecasting), 40.75 del.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $215-217 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $22-24 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 100.00.

Titanium: Sponge, 99.3+ % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+ % hydrogen reduced, $3.00-3.80.

Zinc: Prime western, 12.50; brass special, 12.75; intermediate, 13.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 13.75; special high grade, 14.00 deld. Diecasting alloy ingot No. 3, 15.75; No. 2, 16.25; No. 5, 16.00 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7.00 per lb; over 500 lb, $6.50 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.50; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass, No. 115, 30.75; tin bronze, No. 225, 41.50; No. 245, 36.00; high-leaded tin bronze, No. 305, 35.25; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 29.25.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.975, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.955, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 38.35; l.c.l., 38.98. Weatherproof, 20,000-lb lot, 38.55; l.c.l., 39.30.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R...	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	....
0.136-0.096	43.20-48.30	....
0.126-0.103	....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	....
0.077-0.061	....	39.50-40.70
0.068-0.061	44.30-52.20	....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	46.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.85
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or	—Round—		—Hexagonal—	
across flats*	2011-T3	2017-T4	2011-T3	2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1 125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.530	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random length diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheets and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.75-25.25; No. 2 heavy copper and wire, 21.75-22.25; light copper, 20.25-20.75; No. 1 composition red brass, 18.50-18.75; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 33.00c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	57.13b	54.86c	....	58.32	29.000	29.000	28.250
Yellow Brass	50.57	36.06d	50.86	54.23	22.250	21.250	20.250
Low Brass, 80%	53.53	53.22	53.82	57.09	24.750	24.500	24.000
Red Brass, 85%	54.58	54.27	54.87	58.14	25.750	25.500	25.000
Com. Bronze, 90%	56.17	55.86	56.46	59.48	26.750	26.500	26.000
Manganese Bronze	58.86	52.21	62.69	....	20.875	20.625	19.875
Muntz Metal	53.20	48.26	....	....	20.875	20.625	20.125
Naval Brass	55.12	48.68	61.43	58.78	20.750	20.500	20.000
Silicon Bronze	62.86	61.80	62.15	80.79	28.375	28.125	27.375
Nickel Silver, 10%	65.98	68.06	68.06	....	26.875	26.625	14.937
Phos. Bronze	77.44	78.19	77.69	79.37	29.875	29.625	28.625

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 16.00-16.50; light brass, 12.25-12.50; heavy yellow brass, 13.25-13.75; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe, 15.75-16.20.

Lead: Soft scrap lead, 8.50-9.00; battery plates, 4.25-4.50; linotype and stereotype, 10.00-10.50; electrotype, 8.25-8.75; mixed babbitt, 9.50-10.00.

Monel: Clippings, 29.00-31.00; old sheets, 25.00-27.00; turnings, 20.00-22.00; rods, 29.00-31.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 4.25-4.75; new diecast scrap, 4.00-4.25; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.50-15.00; mixed high copper clips, 12.50-13.00.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.25-16.75; segregated high copper clips, 15.50-16.00; mixed low copper clips, 15.50-16.00; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 59.00; light scrap, 54.00; turnings and borings, 39.00.

Copper and Brass: No. 1 heavy copper and wire, nom.; No. 2 heavy copper and wire, 26.50; light copper, 23.00; refinery brass (60% copper) dry copper content, 24.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, nom.; No. 2 heavy copper and wire, 25.50; light copper, 23.00; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 17.00; yellow brass turnings, 16.00; radiators, 18.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.40.

Copper: Flat-rolled, 50.04; oval, 48.00; 5000-10.000 lb; electrodeposited, 42.50, 2000-5000 lb lots; cast, 45.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 118.50; 200-499 lb, 117.00; 500-999 lb, 116.50; 1000 lb or more, 116.00.

Zinc: Balls, 19.75; flat tops, 19.75; flats, 22.50; ovals, 21.75, ton lots.

CHEMICALS

Cadmium Oxide: $1.40 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 16.00; 2000-5,900 lb, 14.00; 6000-11,900 lb, 13.75; 12,000-22,900 lb, 13.50; 23,000 lb or more, 13.00.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 78.50; 100-600 lb, 69.20; 700-1900 lb, 66.40; 2000-9900 lb, 64.60; 10,000 lb or more, 63.30.

Stannous Chloride (Anhydrous): 25 lb, 153.80; 100 lb, 148.90; 400 lb, 146.50; 800-19,900 lb, 105.60; 20,000 lb or more, 99.50.

Stannous Sulphate: Less than 50 lb, 139.00; 50 lb, 109.00; 100-1900 lb, 107.00; 2000 lb or more, 105.00.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from Page 155)

get down as much ore as possible before weather halts shipping, the month's total was 782,196 tons greater than in November, 1958, when 4,528,563 tons were shipped.

Shipments in the 1959 navigation season to the end of November were 43,541,344 tons, only 9,251,371 tons less than were moved to the same date in the 1958 season. Some ore shippers plan to continue in operation through December as long as weather permits.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 152

Resumption of operations at automotive plants as steel flows steadily from the mills assures active

CLASSIFIED

Accounts Wanted

TWO EXPERIENCED MEN selling to steel producing industry are interested in adding one or two lines of equipment sold to this field. Located in Cleveland. Reply Box 811, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

PLANT SUPERINTENDENT
WELDED WIRE PRODUCTS, NEW ORLEANS
Established manufacturer of welded wire products seeks capable man for new plant in New Orleans. Must be presently employed or have experience at foreman level or above in the field of automatically welded wire products such as display racks, shelves, welded mesh, baskets, shopping carts, etc. Experience with electric welding equipment and in handling a work force of 15 to 30 men is essential. Excellent opportunity for a man who is willing to work hard and grow with the new plant. Give full details and background. (Our employees know of this ad.) Box 813, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGICAL ENGINEER with at least 5 yrs. experience in wire drawing of stainless steels & related alloys needed by mfr. in northern New Jersey area. Send complete record to Box 816, STEEL, Penton Bldg., Cleveland 13, Ohio.

ROLLING MILL SUPERINTENDENT
Outstanding immediate opportunity and excellent future in steel division of leading corporation nearing completion of first phase of long range expansion program. Must be thoroughly experienced in semi-continuous and hand merchant bar mill operation. Reply Box 814, STEEL, Penton Bldg., Cleveland 13, Ohio.

WIRE DRAWING FOREMAN wanted by firm manufacturing stainless steel & nonferrous wire, located Newark, N. J. area. Address reply to Box 809, STEEL, Penton Bldg., Cleveland 13, Ohio.

COLD ROLLING FOREMAN for non-ferrous & stainless wire mfr. located northern New Jersey area. Send reply to Box 810, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGICAL ENGINEER in Newark, N. J. area with at least 5 yrs. experience cold rolling of stainless steels & related alloys. Send complete record to Box 812, STEEL, Penton Bldg., Cleveland 13, Ohio.

FLORIDA
PRODUCTION SUPERINTENDENT
SHEET METAL PLATING AND PAINTING

EMR—with over 450 employes and modern air conditioned facilities exceeding 100,000 sq. ft.—has a newly created position immediately available for an experienced engineer to set up and manage a custom sheet metal, electro-plating, and spray painting facility.

Candidate should be between the ages of 30 and 45 with previous related experience in the electronic manufacturing industry.

Send resume to John Truitt, Personnel Manager

ELECTRO-MECHANICAL RESEARCH, INC.
Sarasota, Florida

ELECTRICAL ENGINEER
Graduate Electrical Engr.

with experience—**STEEL PLANT EQUIPMENT** and **CONSTRUCTION** desired for Venezuelan Steel Plant.

Forward resume of experience, education & salary requirements in confidence to:—

Ramseyer & Miller, Inc.
11 West 42nd St. New York 36, N. Y.

FORGING PRESS WANTED

1000 to 2000 ton hydraulic forging press with steam intensifier.

Please give full description with reply.

General Ore & Chemical Corp.
417 So. Hill Street
Los Angeles 13, California

BERRY BEARING COMPANY
Bearing Headquarters
Since 1920
Phone: DAnube 6-6800
2633 S. Michigan Ave. • Chicago 16, Ill.

FOR SALE

Pannier Bar and Tube Printer, Type J, Capacity ¼ to 2½" O.D., 300 feet per minute. Machine is in good operating condition.

SUPERIOR TUBE COMPANY
P. O. Box 119 Wapakoneta, Ohio

WE CAN HELP YOU TO CONTACT

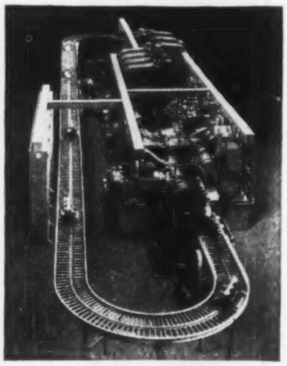
high calibre men to fill specific jobs you have in mind—

Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

STEEL from Wheelock, Lovejoy
BULLETIN

W-L DETROIT For the first time, HY-TEN D-2 air hardening steel now available here in rounds, squares, flats and billets. Also a fine stock of standard alloy grades, especially A-8620, as well as all HY-TEN grades. Excellent service from our new warehouse.

W-L CHICAGO Steady demand for "B" No. 3X for flame-hardened parts such as boring bars. Good stocks of HY-TEN AIS the best carburizing alloy steel, and freest machining available today—a new W-L exclusive!



W-L CINCINNATI This 23-station Avey Line-O-Dex transfer machine, designed and built by The Avey Division of Motch & Merryweather Machinery Co., Cincinnati, Ohio, is equipped with spindles made of our HY-TEN "B" No. 2. This grade was chosen for its great tensile strength (100,000 P. S. I. in the natural condition), toughness, and fine wearing qualities.

W-L CAMBRIDGE We are now distributing FLEXANGLE, the easy-to-erect structure assembly for all types of racks, shelves, platforms, etc. It's completely universal and low in cost — can be used anywhere, by anyone, for any storage purpose.

W-L HILLSIDE Our stock of flat and square sizes in HY-TEN M Temper Oil Hardening Steel can save you time and money in your tooling program. HY-TEN "B" No. 3X pre-heat treated in rounds, squares and flats available in a wide range of sizes. Billets on hand for hammer forging in all grades of HY-TEN.

W-L CLEVELAND Excellent stock of brake die flats and squares. Also many sizes up to 16" x 18" in HY-TEN Mold Steel. Excellent deliveries.

W-L BUFFALO A wide range of rounds and hexagons in cold drawn AISI leaded and non-leaded A-4140. Also many sizes of the new "B" No. 3X-40 in rounds and hexagons.

Write our Cambridge office today for your *free* Wheelock, Lovejoy Data Sheets. They'll give you complete technical information on grades, applications, physical properties, tests, heat treating, etc.

WHEELOCK,
LOVEJOY
& COMPANY, INC.
132 Sidney Street, Cambridge 39, Mass.

AMERICAN STEEL WAREHOUSE ASS'N

AGENTS: Southern Engineering Company, Charlotte, N. C.; Sanderson-Newbould, Ltd., Montreal & Toronto

consumption of coke by automotive casting foundries during December. Expectations are automotive requirements will be exceptionally heavy over the first half of next year.

A miniature coke oven, producing blast furnace coke in pounds rather than in tons and under closely controlled conditions, has been placed in operation at the Campbell Works, Youngstown Sheet & Tube Co., Youngstown. The oven is part of a new carbonization laboratory for experimental work on coal and coke.

Japanese Steelmakers to Purchase Russian Coal

Tokyo reports say that representatives of Japan's eight major pig iron producers informed the Soviet trade mission they would annually purchase 360,000 tons of coking coal from Russia. They said Fuji Iron & Steel Co. would buy Kuznetsk coal and the eight companies would purchase 260,000 tons of Sakhalien coal annually.

Japan's Yawata Iron & Steel Co., largest in Asia, has requested government approval of a six year, $600 million expansion program that would nearly double its production. The plan, running until mid-1966, would increase pig iron production from the 2,931,000 tons to 5,875,000, steel ingots from 4,250,000 to 6,942,000, and other steel production from 3,329,000 tons to 5,542,000.

Price Premium Eliminated On Selective Substations

General Electric Co., Schenectady, N. Y., has eliminated the price premium for selectively co-ordinated load center unit substations. Ratings start at 300 kva for use in commercial and industrial power distribution systems up to 600 volts. The new price levels are established on a par with prices for fully rated load centers, the most commonly used types.

GE also has announced a reduction of about 5 per cent in published prices of large power transformers, 12,000 kva and higher. It also revised price terms.

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things are popping at

SHERATON-CLEVELAND HOTEL

- 100% air-conditioning of all guest rooms, restaurants, and function rooms.
- Major room redecoration (both guest and function rooms).
- Free radio and television in all guest rooms.
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- Now "Reservatron" — World's first electronic hotel reservations service reserves and confirms your reservations in a split second in Sheraton cities from coast to coast in the USA, Canada and Hawaii.
- Many new convention innovations and banquet facilities.
- Modern new Presidential Suite.
- New stores and guest services.
- New charcoal grill specializing in steaks, ribs and chops.
- New popular priced coffee shop "The Minute Chef"—for busy people.
- And many more new developments.

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meal time
night time
any time

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Bronze Room
The Patio
Transit Bar

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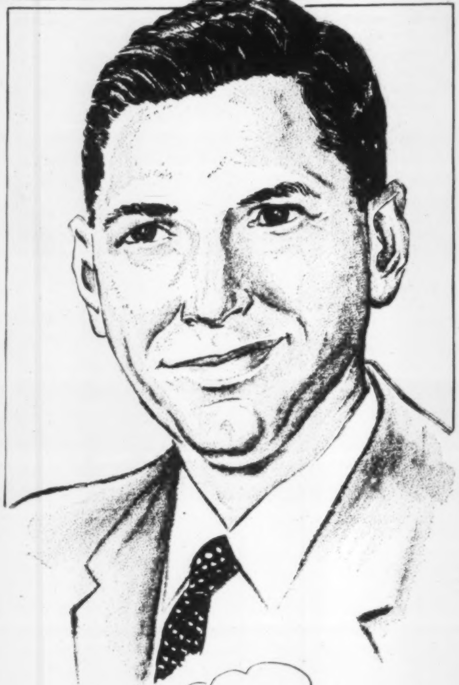
You get steel + plus from U. S. Steel



"We recommended a change in steel and processing that saves them $6,000 a year,"

SAYS SPENCE WILLIAMS
TCI SALES REPRESENTATIVE, COLUMBIA, S. C.

"Our customer, the Owen Joist Company, Cayce, South Carolina, previously bought steel strip in coils to make channels for bridging their bar joists.

"After taking a hard look at their operation not long ago, we suggested they switch to hot rolled sheet in coils and have it slit by an outside processor. This saved them almost $5,000 a year. To make the anchors for their bar joists, we recommended they buy a different type of H. R. Steel . . . and in coils rather than cut-to-length strip. The coils could then be cut to required size by a steel processor. This method practically eliminated scrap loss and saved the company an additional $1,000 a year."

MERR-ILY WE ROLL ALONG... ROLL ALONG

WILL YOU LET ME HAVE A LITTLE SCRAP OF STEEL... ABOUT SO GROSS...
I WANTA MAKE A...
BROTHER, AROUND HERE WE DON'T HAVE ENOUGH WASTE...
...TO MAKE A WATCH CHARM FOR A MIDGET

Alert sales assistance like this is profitable for both consumer and supplier. And technical sales assistance in the selection and most efficient use of steel is only one of the many U. S. Steel Plus services that mean more profit to you.

When you buy from U. S. Steel, you get steel plus technical assistance . . . research . . . facilities . . . marketing assistance

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with the same care
you used in buying
the machine tool
to run them.**

GET THE MOST OUT OF YOUR EQUIPMENT

Regardless of size or age of equipment, the smart shop can strengthen its competitive position by standardizing on Cogsdill for all its drilling operations. Cogsdill twist drills are unsurpassed for uniform life and performance, with longer runs between tool changeover.

*Cogsdill . . . the name to remember for quality
. . . to watch for progress.*

COGSDILL TWIST DRILL CO., INC., Greenfield, Mass.

Stocking Warehouses: Detroit, Los Angeles, Greenfield

INDUSTRIAL DISTRIBUTORS
SERVING INDUSTRY ECONOMICALLY
THE RIGHT HAND OF PRODUCTION

Aronson positioner holds, tilts, turns 175-ton weldments . . . Timken® bearings roll ALL the loads

YOU can handle almost any kind of weldment from one up to 175 tons with this Aronson Machine Company "Excalibur" Positioner. It's designed to position, rotate and weld automatically, do it smoothly, at low cost, in a wide range of speeds—with 24 Timken® tapered roller bearings to roll *all* the loads. Timken bearings are used in the main table spindle, left and right hand tilting journals, tilting drive pinion and worm, and rotation drive pinion and worm. Like Aronson, thousands of machine builders use Timken bearings because they:

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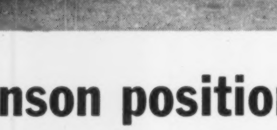
2) *Give you more for your money.* You get that in better service from graduate *engineering* representatives; in better bearing service because of Timken Company leadership in bearing research and testing facilities; in better bearing quality because we start with industry's finest bearing steel. And the steel's nickel-rich for extra toughness.

To be sure of better machines, be sure the ones you build or buy are Timken bearing-equipped. **When you buy Timken bearings you get . . .** *1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) The pace setter in lower bearing costs.* The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*



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